Smooth Rock Falls Forest Independent Forest Audit 2005-2010

Audit Report

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EXECUTIVE SUMMARY

This report, for the Smooth Rock Falls Forest (SRFF or 'the Forest'), documents the results of an Independent Forest Audit conducted by KBM Forestry Consultants Inc. All Crown forests in Ontario are required to be audited at least every five years; the requirement for independent audits arising from MNR's Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario (2003). Regulation 160/04 of the Crown Forest Sustainability Act (S.O. 1994, c. 25) (CFSA) sets out the specific requirements for conducting the audits.

KBM Forestry Consultants Inc. conducted an independent forest audit on the SRFF for the five-year period April 1, 2005 to March 31, 2010. The audit assessed implementation and selected aspects of planning of the final five years of the 2005-10 FMP and planning for the 2010-20 FMP which was not finalized and instead became the 2010-12 Contingency Plan for the amalgamated Cochrane Area Forest (subsequently the Abitibi River Forest). The on-site component of the audit occurred from September 13 to 27, 2010. Document review and interviews occurred throughout the audit process. During the audit term the Forest was managed under an SFL held by Tembec Inc. The principal auditees were the Tembec and the MNR Cochrane District.

Based on the audit, 25 recommendations were made. Recommendations arise from audit team observations of material non-conformances, or may be developed to address situations in which the audit team identifies a significant lack of effectiveness in forest management activities. All audit recommendations are directed at either MNR or Abitibi River Forest Management Inc., a cooperative SFL holder who assumed management responsibilities on the Abitibi River Forest effective April 1, 2010. The majority of recommendations centred on deficiencies in the area of forest management planning. However, the key recommendations, discussed below, arose from audit team observations made in the field. A best practice was identified for the ongoing multi-partner woodland caribou research project that is providing valuable information to inform forest management planning and another for the comprehensive monitoring of silvicultural effectiveness and compliance by MNR.

Of the 25 audit recommendations there are three areas of concern that are considered key since they highlight the need to significantly alter certain current practices on the Forest in the interest of sustainability. The first area of concern arises from the lack of clear direction from the Province that has allowed forest operations to leave significant amounts of waste wood fibre (slash) at roadside where it occupies productive forest land and prevents establishment of regeneration. This practice is not unique to the SRFF or the amalgamated Abitibi River Forest; management of waste wood (both slash and chipper debris) has been a recurring issue for years as evidenced by the many recommendations made in previous IFAs across Ontario. Only a change at the Provincial policy level, supported by forest management plan commitments and enforcement of such commitments through the Provincial compliance program is likely to lead to an effective, permanent solution. The second area of concern is associated with implementation of harvesting patterns that protect existing regeneration on upland sites. In the audit team's view this practice will lead to degrading of future stand composition through retention of less desirable species that will form a higher component of the new stand, and reduced productivity due to the inherently higher levels of competition on upland sites, resulting in lower stocking levels. A third related area of concern is the retention of mature larch seed trees in harvest blocks which is also contributing to a significant increase in the larch component on lowland sites.

The audit team concluded that management of the Smooth Rock Falls Forest was generally in compliance with the legislation, regulations and policies that were in effect during the audit term and the Forest was managed in compliance with the terms and conditions of the Sustainable Forest Licence held by Tembec Inc. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol.

No recommendation is made on licence extension since a new licence with a twenty year term was issued to Abitibi River Forest Management Inc. for the Abitibi River Forest in August 2010. A recommendation on licence extension will occur at the next IFA.

Rod Seabrook, EP(EMSLA)
Lead Auditor, on behalf of the audit team

1.0 TABLE OF RECOMMENDATIONS AND BEST PRACTICES

Recommendation on Licence Extension
The audit team concludes that management of the Smooth Rock Falls Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and the Forest was managed in compliance with the terms and conditions of the Sustainable Forest Licence held by Tembec Inc. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol. No recommendation is made on licence extension since a new licence with a twenty year term was issued to Abitibi River Forest Management Inc for the Abitibi River Forest in August 2010. A recommendation on licence extension will occur at the next IFA.

Recommendations Directed to the SFL Holder / MNR District
Recommendation 1: MNR must ensure that the Local Citizens Committee Terms of Reference are updated to meet the content requirements of the Forest Management Planning Manual.
Recommendation 2: MNR must ensure that the approval process for public notices meets the requirements of the Forest Management Planning Manual.
Recommendation 3: MNR must ensure that public notices meet the content requirements of the Forest Management Planning Manual.
Recommendation 4: MNR must ensure that the Steering Committee meets as required during the development of the 2012-22 FMP and that minutes for those meetings are recorded, distributed to planning team members and included in the Forest Management Plan supplementary documentation.
Best Practice 1: The ongoing multi-partner woodland caribou study is an excellent example of applied research that has provided and continues to provide significant science-based contributions to forest management planning.
Recommendation 7: Abitibi River Forest Management Inc. must ensure that the next Forest Management Plan contains biological or silvicultural rationale for planned clearcuts greater than 260 ha.
Recommendation 8: Abitibi Forest Management Inc. must consider the harvest profile selected in the 2010-12 Contingency Plan when developing the profile for the next FMP so that further substitution into younger age classes does not occur.
Recommendation 10: Abitibi River Forest Management Inc. must amend the utilization standards in the 2010-12 Contingency Plan to be consistent with the Northeast Region Operations Guide for Marketability Issues document or provide compelling rationale for the significant deviation from that direction document. The 2012-22 Forest Management Plan utilization standards should also conform to the Guide direction or provide rationale for departure.
Recommendation 11: The Abitibi River Forest planning team must consider on-the-ground results, current Provincial direction and the remote nature of a large portion of the Forest when modelling for productive land loss due to waste wood fibre in the 2012-22 Forest Management Plan.
Recommendation 13: Abitibi River Forest Management Inc. must include direction regarding management of chipping debris in the next Forest Management Plan.
Recommendation 14: Abitibi River Forest Management Inc. must consider the renewal profile selected in the 2010-12 Contingency Plan when developing the profile for the next Forest Management Plan and include sufficient analysis in the 2012-22 Forest Management Plan to justify the significant deviation from the planned Long Term Management Direction during the two year contingency period.
Recommendation 15: Abitibi Forest Management Inc. must review the planned renewal assessment program in the 2010-12 Contingency Plan to ensure that the next Forest Management Plan covers the existing shortfall.
Recommendation 16: Abitibi River Forest Management Inc. must ensure the slash management plan in the 2012-22 Forest Management Plan can meet plan objectives and guidelines focused on minimizing loss of productive land. Abitibi River Forest Management Inc. should also deal with treatable backlog areas of slash.

Recommendation 17: Abitibi River Forest Management Inc. must:

a) conduct an immediate review of all upland sites harvested under the Careful Logging Around Advanced Growth system since 2005 and implement remedial silvicultural treatments, where practical, on sites found not likely to become a silvicultural success

b) implement exceptions monitoring on all upland Careful Logging Around Advanced Growth sites for which the use of natural advance growth (without planting) as a regeneration method is deemed as not recommended under the Silvicultural Guide.

Recommendation 18: Abitibi River Forest Management Inc. must address the increased presence on the Forest of less desirable tree species such as larch and balsam fir.

Recommendation 19: Abitibi River Forest Management Inc. must develop and implement a Use Management Strategy for the Marceau Road following direction in the 2009 Forest Management Planning Manual; the strategy must be informed by the *Endangered Species Act, 2007.*

Recommendation 20: MNR must establish record keeping procedures that ensure maintenance of public notice records for all amendments.

Recommendation 21: Abitibi River Forest Management Inc. must address the backlog of areas that require assessment of natural regeneration.

Recommendation 22: Abitibi River Forest Management Inc. must address the current backlog of Free-to Grow surveys on the Smooth Rock Falls Forest.

Best Practice 2: The monitoring of silviculture effectiveness and compliance by the Ministry of Natural Resources during the audit term was deemed to be excellent.

Recommendation 23: MNR must conduct spot checks on the outstanding suspension reports and determine any compliance action to be taken.

Recommendation 25: The Cochrane District Manager must ensure that submission timelines for Independent Forest Audit Action Plans and Status Reports are met.

Recommendations Directed to Corporate or Regional MNR

Recommendation 5: Corporate MNR, in consultation with the Ministry of Environment, must investigate and report upon lessons learned in the amalgamation and associated planning challenges encountered in the creation of the Abitibi River Forest to ensure information management systems and other procedures are adequate to deal with future amalgamations.

Recommendation 6: Corporate MNR must consider requiring that trade-off analysis be conducted using an appropriate decision support tool on amalgamated forests.

Recommendation 9: MNR Region must update the *Northeast Region Operations Guide for Marketability Issues* document as follows:

- reduce the allowance for residual standing trees to no more than 25% canopy closure to better align the Guide with inventory standards
- incorporate a requirement to provide information, in addition to the current Forest Resource Inventory description, to confirm actual stand conditions prior to finalizing operational plans
- clarify the allowance for bringing unmarketable trees to roadside in order to minimize the loss of productive area along roadways

Recommendation 12: Corporate MNR must develop a policy to address waste fibre management, consistent with the intent of minimizing losses of productive forest land, and provide associated direction to MNR regions, districts and the forest industry, including standards for acceptable allowances for conversion of productive forest land to non-productive forest land. MNR should also periodically report to the public the cumulative loss of area and growing stock potential due to forest land occupied by waste fibre.

Recommendation 24: Corporate MNR must review the reporting procedures and consider modifying them to recognize multiple successional pathways to improve the adaptive management process.

2.0 INTRODUCTION

3.1 Audit Process

Independent Forest Audits (IFAs) are a requirement of the Crown Forest Sustainability Act (S.O. 1994, c.25) (CFSA) and the Forest Management Class Environmental Assessment on Crown Lands in Ontario. Every forest management unit in Ontario must be audited by an independent party at least once every five years. The Independent Forest Audit Process and Protocol (IFAPP) was developed by MNR to provide a comprehensive and consistent method of evaluating forest management activities on Crown land. It serves as a framework that provides a structured approach to evaluating whether or not forest management activities meet the requirements governing forestry practices on Crown land in Ontario.

Fifth year IFAs of the Cochrane-Moose River Management Unit (CMRMU), Iroquois Falls Forest (IFF) and Smooth Rock Falls Forest (SRFF) were conducted for the period April 1, 2005 to March 31, 2010 by KBM Forestry Consultants Inc. (KBM) in 2010 in accordance with the *Crown Forest Sustainability Act*, Section 26(3). At the time of audit the three forests were in a state of transition in terms of forest management responsibilities. On April 1, 2010 they were amalgamated with the Nighthawk Forest to form the Abitibi River Forest.

A cooperative shareholder agreement was signed in January, 2010 that formed a new management company, Abitibi River Forest Management Inc. (ARFMI). An SFL for the Abitibi River Forest was issued to ARFMI in October 2010, covering the term April 1, 2010 to March 31, 2030. Until the new SFL was in place, forest management responsibilities resided with Tembec (Smooth Rock Falls Forest), AbiBow (Iroquois Falls Forest), and the Cochrane District MNR (Cochrane-Moose River Management Unit). ARFMI has entered into a service provider contract with First Resource Management Group Inc. (FRMG). FRMG is currently transitioning the forest management activities and was the point of contact for the IFA.

Within the report the audit team has made recommendations to address instances of non-conformance to a law and/or policy, or an identified lack of effectiveness in forest management activities. Recommendations are listed in the table in the previous section and presented within the main body of the report together with a brief description of the issue leading to the recommendation. A full discussion of the issue, including the link to the IFAPP principle, criteria and audit procedure, associated background information, summary of evidence and conclusion leading to the recommendation is contained in There are three areas of concern arising from the audit that are considered key since they highlight the need to significantly alter certain current practices on the Forest in the interest of sustainability. The first area of concern arises from the lack of clear direction from the Province that has allowed forest operations to leave significant amounts of waste wood fibre (slash) at roadside where it occupies productive forest land and prevents establishment of regeneration. This practice is not unique to the SRFF or the amalgamated Abitibi River Forest; management of waste wood fibre (both slash and chipper debris) has been a recurring issue for years as evidenced by the many recommendations made in previous IFAs across Ontario. Only a change at the Provincial policy level, supported by forest management plan commitments and enforcement of such commitments through the Provincial compliance program is likely to lead to an effective, permanent solution. The second area of concern is associated with implementation of harvesting patterns that protect existing regeneration on upland sites. This practice is leading to degrading of future stand composition through retention of less desirable species that will form a higher component of the new stand, and reduced productivity due to the inherently higher levels of competition on upland sites resulting in lower stocking levels. A third related area of concern is the retention of mature larch seed trees in harvest blocks which is also contributing to a significant increase in the larch component on lowland sites as well.

The audit team concludes that management of the Smooth Rock Falls Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and the Forest was managed in compliance with the terms and conditions of the Sustainable Forest Licence held by Tembec Inc. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol.

No recommendation is made on licence extension since a new licence with a twenty year term was issued to Abitibi River Forest Management Inc. for the Abitibi River Forest in August 2010. A recommendation on licence extension will occur at the next IFA.
Appendix 1.

As the new SFL is in place, related audit findings are now directed to ARFMI, instead of the individual forest managers responsible during pre-amalgamation. Audit recommendations related to responsibilities of MNR continue to be directed to the appropriate organizational level within MNR. More detailed information on the audit process and sampling is provided in Appendix 4 of this report.

Audit team members and their qualifications are presented in Appendix 6. The audit assessed portions of planning and implementation as described in Table 1.

Table 1. Forest management plans within audit scope.

Implementation and selected aspects of planning	2005-10 Smooth Rock Falls Forest FMP
Planning	2010-20 Cochrane Area Forest* FMP - planning process and LTMD development: Note this plan did not proceed to completion and was replaced by the 2010-12 Contingency Plan for the Cochrane Area Forest, referred to below.
	2010-12 Contingency Plan Cochrane Area Forest planning process and development

* The Cochrane Area Forest has become the Abitibi River Forest consisting of the former Cochrane-Moose River Management Unit, Smooth Rock Falls Forest, Iroquois Falls Forest, and the Nighthawk Forest.

3.2 Management Unit Description

The Smooth Rock Falls Forest is located in Northeastern Ontario within MNR's Northeast Region. A sustainable forest license (SFL) was first issued to Malette Inc. in 1995 and was subsequently transferred to Tembec Inc. during that same year. Tembec's SRFF SFL was surrendered prior to the issuance of the SFL to ARFMI for the Abitibi River Forest in 2010.

During the audit term, the majority of wood harvested from the Smooth Rock Falls Forest was processed by facilities in Cochrane, Kapuskasing and Timmins.

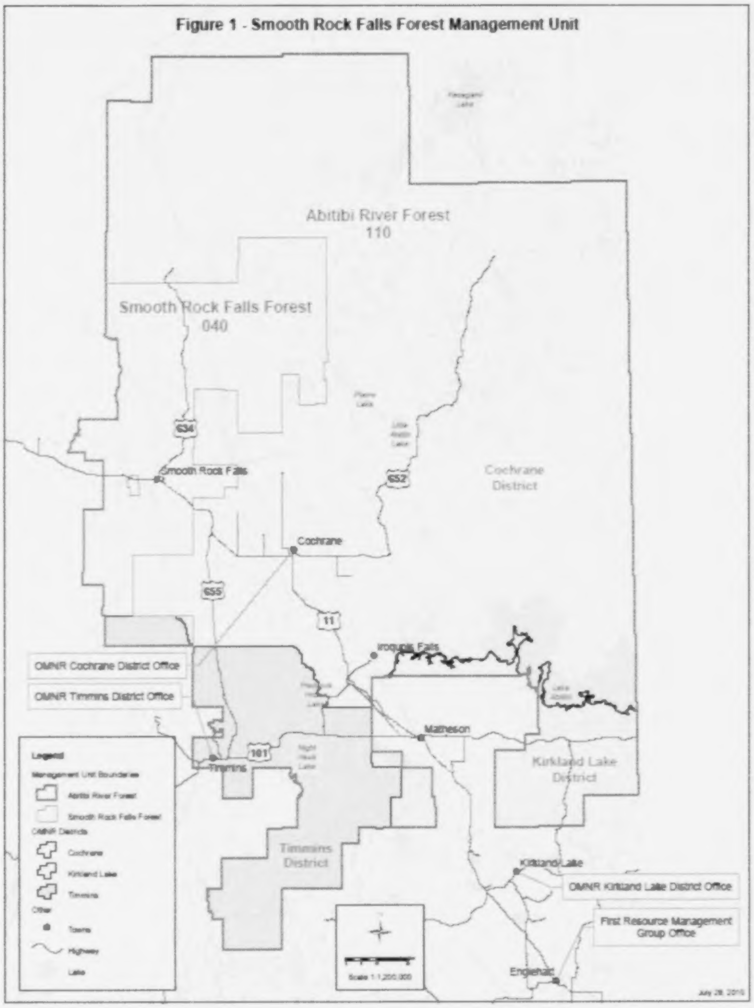

Figure 1 - Smooth Rock Falls Forest Management Unit

Abitibi River Forest
110
Smooth Rock Falls Forest
040
Pierre Lake
Little Abitibi Lake
634
Smooth Rock Falls
652
Cochrane District
Cochrane
655
11
OMNR Cochrane District Office
OMNR Timmins District Office
Iroquois Falls
Lake Abitibi
Frederick House Lake
Matheson
101
Timmins
Night Hawk Lake
Kirkland Lake District
Timmins District
Kirkland Lake
OMNR Kirkland Lake District Office
First Resource Management Group Office
Englehart
Legend
Management Unit Boundaries
Abitibi River Forest
Smooth Rock Falls Forest
OMNR Districts
Cochrane
Kirkland Lake
Timmins
Other
Towns
Highway
Lake
Scale 1:1,200,000
July 28, 2010

Figure 1. Location of the SRFF in relation to Northeastern Ontario and surrounding Forest Management Units and communities as well as the amalgamated Abitibi River Forest (Source: Comparison and Trend Analysis Report).

The SRFF borders the Gordon Cosens Forest to the west, the Moose River sub-unit to the north, the Nighthawk Forest and Cochrane sub-unit to the east and the Romeo Malette to the south. Boundary locations for the SRFF were changed in 2003 with the addition of three portions from the Cochrane sub-unit and one portion from the Moose River sub-unit. The Forest is oriented North-South and spans 120 kilometres from Abitibi Canyon in the north to a point halfway between the towns of Smooth Rock Falls and Timmins in the south. The Forest is approximately 70 kilometres wide at its widest point. The Town of Smooth Rock Falls is situated near the centre of the Forest.

The SRFF, with a landbase of approximately 530,000 ha, lies in part within the northern Clay Belt which is characterized by moderately to gently rolling bedrock, generally covered by deep deposits of clay, silt and sand. Limited eskers running in a north-south direction contrast with an otherwise flat topography. The majority of the forest soils are clay and peat with some areas of glacial-fluvial silts and sands. Bedrock caps are not uncommon in pockets on the Unit. The lowland, moist to wet site conditions are susceptible to rutting if operated during the frost-free period so a majority of harvesting activities occur during the winter.

The Forest lies fully within the Boreal Forest Region of Ontario and forest cover is predominantly lowland black spruce stands with small components of larch and cedar and infrequent upland stands dominated by spruce, poplar, birch, balsam fir and occasional jack pine. Crown managed productive forest land occupies 365,864 ha. The managed Crown production forest is comprised of 345,163 ha of regular production forest stands, 4,719 ha of recent disturbance (harvest areas and natural depletion areas i.e. fires) and 20,576 ha of areas deemed to be below regeneration standards. Black spruce is by far the dominant working group. Forest cover composition and age class structure are presented in Figure 3.

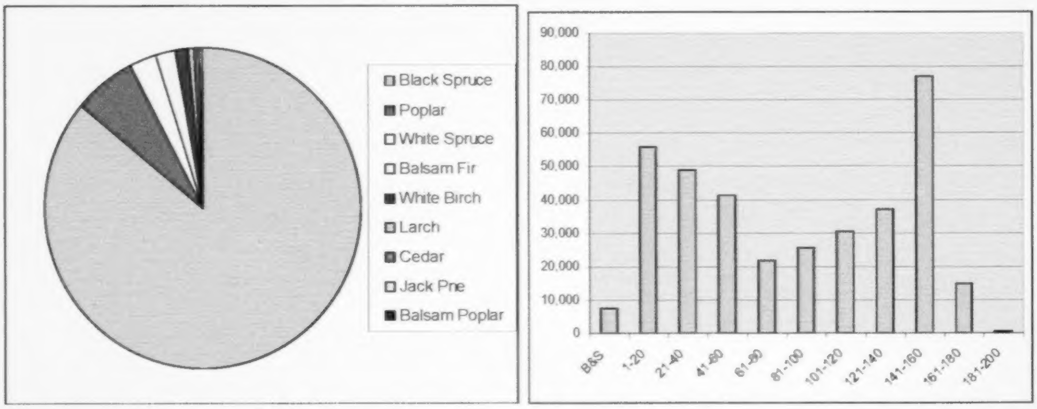

Figure 2. *(Left)* Proportion of forest cover by working group. (Source: FMP Table 2, 2005-2010 Smooth Rock Falls Forest FMP). *(Right)* Age class distribution. (Source: AR-11, Comparison and Trend Analysis Report).

3.3 Current Issues

The IFAPP requires a review of High Priority Aspects (HPAs) of the auditees' systems or activities. These are areas of potential focus during the audit related to key issues or management challenges during the audit term. A discussion of potential HPAs on the amalgamated Forest was held during the pre-audit meeting and three HPAs were subsequently included in the Audit Plan, as follows.

1. Underutilization of unmarketable species such as balsam fir
2. Compliance issues on the Marceau Road (former Smooth Rock Falls portion)
3. Staff turnover and layoffs in the forest industry

In addition, the audit team deemed that there were other issues that needed focus during the audit, specifically:

4. The severe economic downturn in the forest products industry significantly reduced actual harvest levels compared to planned levels during the audit term. Locally, the downturn aided in the permanent closure in 2006 of Tembec's pulp mill in Smooth Rock Falls and indefinite closure of their sawmill in Timmins. A labour dispute in 2006 and depressed markets for OSB also led to idling of the Grant Forest Products OSB mill in Timmins; this mill is still idle.
5. Piling and burning of roadside logging slash was not conducted on many of the blocks logged since 2006. This will result in areas of productive land being unavailable for regeneration if left in their current state.

All of the issues identified above were reviewed during the audit and comments and recommendations emanating from the audit findings are incorporated into the audit report as appropriate.

3.4 Summary of Consultation and Input to Audit

Opportunities were provided throughout the audit process for consultation with and input from auditees and other interested parties. The audit team spoke with staff from MNR, Tembec, AbiBow, FRMG, Local Citizen Committee (LCC) members, wood supply commitment holders, and members of four First Nation (FN) communities. In addition, comments were received in response to a questionnaire made available to the public. A summary of the methods and input is provided in Appendix 4.

3.0 AUDIT FINDINGS

4.1 Commitment

The Province has documented its commitment to sustainable forestry principally through the Crown Forest Sustainability Act. MNR, in turn, has documented policies and other guidance that establish its commitment to sustainable forestry and resource management, consistent with the requirements of the CFSA. These are communicated throughout MNR and are promoted with resource users and the general public. MNR maintains a public website where these commitments are available:
http://www.mnr.gov.on.ca/en/Business/Forests/2ColumnSubPage/STEL02_163861.html

Tembec maintains certification of the Smooth Rock Falls Forest to the FSC National Boreal Standard, an internationally recognized sustainable forest management standard. The Standard requires annual third party audits to ensure that the certificate holder remains in compliance with the requirements of the FSC Standard, the most recent audit being in January, 2010. A public summary report on the audit is found at
http://info.fsc.org/servlet/servlet.FileDownload?retURL=%2Fapex%2FPublicCertificateDetails%3Fid%3Da0240000005uwilAAA&file=00P40000005aZRsEAM

Tembec has an Environmental Policy that includes commitments to sustainable forest management and a separate environmental management program known as Forever Green® that contains a set of guiding principles and associated values to provide direction for its forest managers. It also requires implementation of an environmental management system in conformance with the ISO 14001 standard.

Commitment to sustainable forestry, as demonstrated through compliance to regulatory requirements and conformance to the direction contained in forest management guides and forest management plans was demonstrated by both MNR and Tembec during the audit term.

4.2 Public Consultation and Aboriginal Involvement

Three LCCs are associated with the Abitibi River Forest (Cochrane, Kirkland Lake and Timmins). A sample of LCC members contacted during the audit was satisfied with the performance of the committees, the support provided by MNR and the cooperation of the companies. There was a desire expressed by members for more representation on the LCCs from area Aboriginal communities. Despite ongoing efforts, as in other districts, securing Aboriginal representation on LCCs has been a challenge.

Some concerns were stated over the low turn out at information centres, and the advertising style and frequency of public notices. Minutes of LCC minutes indicated overall acceptable levels of attendance by members and a good coverage of topics. Terms of Reference for the individual LCCs were current; however, the Cochrane LCC Terms of Reference (updated version March 2009) did not meet all the content requirements of the 2004 FMPM.

Recommendation 1: MNR must ensure that the LCC Terms of Reference are updated to meet the content requirements of the FMPM.

The Cochrane Area LCC is the lead LCC for forest management planning on the Abitibi River Forest and there was active participation on the planning team during planning for the 2010-12 CP. The Committee was reorganized in 2006 in response to concerns raised during the previous IFA about the functionality of the Committee. The reorganization appears to have been effective in addressing the concerns. Members found meetings productive and informative; dialogue is very much encouraged and questions are welcomed.

MNR provided adequate support for the LCC and has kept LCC members up to date on current events, answered questions in a quick and timely manner, and ensured minutes were distributed after each meeting. According to LCC member interviews and questionnaire responses, the MNR District Manager and SFL holder attended most meetings where topics of interest were discussed and evidence was presented that demonstrated LCC involvement in the categorization of amendments. LCC members found AbiBow and Tembec representatives to be cooperative and reasonable; they listened to concerns with an open mind and tried their best to address issues.

In general, the public does not use the LCC as a method of raising concerns or accessing information on forest management. Most members of the LCC do not formally report back to the stakeholder group they represent. If and when they did, it was generally in the form of a casual conversation.

Multiple learning opportunities were provided to members of the LCCs (e.g. forum in Sault Ste. Marie, Aboriginal Sensitivity Training, Caribou Planning, Bearwise). Most members had attended at least one event, and were aware of the other events that were available.

Notifications to the public met FMP requirements for the 2010-12 CP and there were no concerns that led to implementation of the issue resolution process during planning.

Eleven amendments were made to the 2005-10 FMP, mostly administrative in nature. Amendment #4 to the 2005-10 FMP was a major amendment for the purpose of adjusting the harvest allocation. The amendment was approved by the MNR District Manager on September 6, 2007 and subsequently by the Regional Director on October 9, 2007. However, Notices of Review of the Approved Major Amendment were dated September 20, 2007, before the amendment was formally approved by the Regional Director. This is contrary to the 2004 FMP which requires approval of a major amendment by the Regional Director before it is made available for inspection.

Recommendation 2: MNR must ensure that the approval process for public notices meets the requirements of the FMPM.

Amendment #8 was a minor amendment to alter a road use strategy and the associated map. All public consultation requirements were met with the exception that the public notice letters did not contain all of the required information (e.g. a statement that further public consultation may be required if concerns are raised).

Recommendation 3: MNR must ensure that public notices meet the content requirements of the FMPM.

Notifications to the public met FMP requirements for the 2010-12 CP and there were no concerns that led to implementation of the issue resolution process during planning.

Prior to amalgamation of the forests, three First Nation communities - Taykwa Tagamou, Moose Cree and Wahgoshig - were involved in the CMRMU, Smooth Rock and Iroquois Falls Forests. With amalgamation, an additional four communities - Flying Post, Mattagami, Matachewan and Beaverhouse - were included due to their proximity to the amalgamated forest. This coincided with preparation of the 2010-20 FMP (subsequently the 2010-12 CP) for the Cochrane Area Forest.

Flying Post reserve is on west side of the Romeo Mallete Forest and was not interested in engagement during the development of the 2010-12 CP but asked to be made aware of any issues that may involve their traditional territory. There are no residents occupying the reserve at this time. Mattagami First Nation is located at the southern end of the Romeo Mallete Forest. This group once had a forest contracting business and had some contracts with Domtar; however they are not currently interested in conducting forestry operations. Matachewan is also more associated with the Timiskaming Forest and Nighthawk Forest. Due to location, opportunities were limited for the communities of Flying Post, Mattagami, Matachewan and Beaverhouse.

All seven FNs were invited to participate on the 2010-12 CP (originally the 2010-20 FMP). Flying Post noted that they did not have any involvement with the process but asked to be kept informed. Prior to the audit a letter was received from the Metis Nation of Ontario voicing concern that they were not given the opportunity for their own consultation process. This letter was addressed by the lead auditor.

Document review and interviews with Aboriginal, company and MNR representatives indicate that all requirements pertaining to Aboriginal consultation were met during the development of the 2010-12 CP.

4.3 Forest Management Planning

Planning Team

Through interviews with company and MNR staff and a review of the 2010-12 CP and Supplementary Documentation, it was determined that planning team derivation and development of the Terms of Reference met all FMPM requirements with one exception - the Terms of Reference was not approved until after the Notice of Invitation was released. The Terms of Reference for the current planning effort (2012-22 FMP) was developed and approved in accordance with the FMPM prior to issuing the Notice of Invitation so no recommendation is required because corrective action has already occurred.

The amalgamation of four forests managed by three agencies, across three Districts created numerous procedural and technical challenges. In addition, the collapse of forest markets led to a loss of revenue to SFL companies. Given these circumstances, it is not surprising that the planning team encountered delays in meeting some checkpoints (i.e. planning inventory and base model) early in the planning process for the 2010-20 FMP. In the final year of plan preparation, these delays had been overcome and the long term management direction was approved. This represents quite an achievement and reflects well upon the individuals and their organizations involved in the planning process under such challenging circumstances.

It may have been possible to have an approved plan in place for 2010, but the remaining time lines were short. In addition, there were concerns that the Caribou Conservation Plan and other regulations arising from the 2007 Endangered Species Act would have a significant impact on a newly approved plan, possibly leading to requests for an Individual Environmental Assessment (EA bump up) or the need for significant amendments. These factors led to a determination by the Steering Committee that a contingency plan would be required.

Compared to an FMP, a contingency plan allows less time for public and MNR review. The reasons for going to a contingency plan were properly documented in the contingency plan proposal; however, some planning team members questioned the need for a contingency plan because, in their opinion, sufficient progress had been made in developing the 2010-20 FMP at the time the decision was made. It would appear that the Steering Committee's rationale for a contingency plan was not fully understood by all planning team members.

The Steering Committee plays an important role in the planning process. The Steering Committee only met twice during the development of the 2010-12 CP, contrary to the Terms of Reference which called for quarterly meetings, and no minutes were recorded for those meetings. The 2009 FMPM directs the Steering Committee to monitor planning progress.

Recommendation 4: MNR must ensure that the Steering Committee meets as required during the development of the 2012-22 FMP and that minutes for those meetings be recorded, distributed to planning team members and included in the FMP supplementary documentation.

Plans

The 2010-12 CP lacked a forest management unit description section. While this was consistent with the approved Contingency Plan Proposal, the FMPM states "*A contingency plan is an interim forest management plan that is required when special circumstances affect the implementation of a forest management plan*". In the audit team's view, a new forest created through amalgamation should have an interim forest management plan that contains a description of the new forest. The amalgamated Abitibi River Forest illustrates the need for MNR to consider the implications of large scale forest amalgamations in not only meeting FMPM requirements but in determining, for example, how LCCs are formed, how roles are distributed among District offices and how trends analyses are interpreted. There are positive aspects of the amalgamation worth noting as lessons learned. The three Districts, in cooperation with the LCCs, developed a protocol that was followed to allow for efficiencies in the delivery of various services.

Questions emerge from this amalgamation that deserve further consideration. For example, since all of the forests had data that met the Forest Information Manual (FIM) requirements, why did it take such a lengthy period of time to develop the planning inventory? Are there problems with FIM or were there inadequate resources to bring the inventory together? Why does the MOE and MNR not consider a forest description for a new forest to be important in a Contingency Plan? Are there redundancies in the planning manual describing the required content of a management plan?

Recommendation 5: Corporate MNR, in consultation with the Ministry of Environment, must investigate and report upon lessons learned in the amalgamation and associated planning challenges encountered in the creation of the Abitibi River Forest to ensure information management systems and other procedures are adequate to deal with future amalgamations.

According to interviews, the 2012-22 FMP under development is already considering a contingency plan requirement for its first year of operation. If a new contingency plan is developed it should include the forest management unit description section.

The plan text and analysis package provided a clear and accurate description of the Sustainable Forest Management Model development. While technical aspects of the model were complete, more sophisticated planning models (i.e. spatial planning tools) could have aided in the analysis of planning issues surrounding the trade-off between socio-economic and non-timber objectives; this is discussed in Recommendation 6, below.

It is apparent that amalgamation allowed for meeting the current planned industrial demand for fibre that otherwise would likely not have been met if each forest prepared separate plans. The long term management direction (LTMD), age class substitution and allocation pattern selected in the 2010-12 CP are a concern with regards to sustaining the flow of forest benefits over the long run.

- The LTMD allows for decreases of some cover types to as low as 70% when compared to levels derived by simulation of fire events at the amalgamated forest level and as low as 40% within subunits. Typically, forests in Northwestern Ontario use a minimum level of 80% relative to levels derived by simulation of fire events. According to ARFMI, forest management plans in Northeastern Ontario most often use a minimum level of 65-70% in the "tests of sustainability". There is no Provincial standard threshold at this time but some direction is expected with the pending release of the *Forest Management Guide for Boreal Landscapes*.
- The harvest allocation also had considerable amounts of substitution of younger forest compared to older age classes identified by the strategic model (SFMM). If these age class substitutions were to continue over the long term, the forecasted flow of forest benefits and other objectives will not be achieved. The age class substitution is discussed in more detail later in this section.
- The LTMD and selected allocation pattern has led to a form of forest zoning, with longer harvest rotations being associated with more distant forests and caribou habitat while shorter rotations are found near mills. This strategy seems reasonable but is not adequately described in the plan in a way that could be grasped by the general public.

The Abitibi River forest is an example of a forest operating at a scale more consistent with the *Forest Management Guide for Boreal Landscape*. Such a scale should allow for better solutions to landscape-level issues. However, the reporting of various forest cover indicators at this large scale may come at the expense of localized issues such as representation of certain forest cover types within some management sub-unit locations. Models other than SFMM allow such trade-offs to be more transparent at different scales of resolution. Given the pressure on wood supply and non timber values, the preparation of forest management plans on amalgamated forests would benefit from a more careful analysis of trade-offs at different scales using additional decision support tools.

Recommendation 6: Corporate MNR must consider requiring that trade-off analysis be conducted using an appropriate decision support tool on amalgamated forests.

MNR should consider requiring that the associated FMP document an acceptable rationale when the decision is made not to use such a tool.

Modelling

Two models were used to define the social and economic impacts of the 2010-12 CP selected management strategy – MNR's Socio-Economic Impact Model (SEIM) and a Regional Community Constellation Impact Model (RCCIM) developed by the Lake Abitibi Model Forest. Normally, only SEIM is used in planning. This extra effort in describing socio-economic impacts using RCCIM is commendable; however, many details are left in the supplementary documents and little explanation is offered in the text of the plan. For example, a section reads; "Wages and salaries will account for 62.0% of Gross Provincial Income impact" without defining what this indicator means. Some additional expertise should be secured to help interpret the outputs of socio-economic models to both inform and report upon the development of the long term management direction. The Planning Team for the next forest management plan should build upon the successful use of a new socio-economic model by securing additional expertise to help interpret the model outputs and then properly report on the likely affects on the long term management direction.

Woodland Caribou

In 1998 a multi-partner research initiative was established to study woodland caribou. This study has contributed significantly to knowledge of caribou movement and range use. Further collaring and tracking of both caribou and wolves is planned.

Best Practice 1: The ongoing multi-partner woodland caribou study is an excellent example of applied research that has provided and continues to provide significant science-based contributions to forest management planning.

Harvest

Eligibility and selection criteria for harvest, renewal and maintenance were well described in the CP. Contingency area planning was also thorough and well done. Planning has occurred so that residual stand structure requirements can be met. This includes provision of insular/peninsular areas, individual residual trees and downed woody material for wildlife use in planned harvest areas.

Yield curves developed for the 2010-12 CP were reduced by volumes planned to be left to meet residual requirements and are reasonable for the Forest. Table FMP-19 contains a summary of planned wood fibre dispersal that indicates achievement of all volume commitments and business arrangements.
The 2010-12 CP contained a number of planned clearcuts greater than 260 ha in size however the plan lacked the required rationale.

Recommendation 7: ARFMI must ensure that the next FMP contains biological or silvicultural rationale for planned clearcuts greater than 260 ha.

Planned harvest in the 2010-12 CP includes a significant amount of age class substitution - about 9,000 ha. The original intent was to re-align the allocation over the remaining eight years of the planned 2010-20 FMP but, according to interviews with MNR staff, the new plan is to produce a 2012-22 FMP. Due to the severe downturn in the forestry sector it is highly unlikely that the full planned harvest will be realized, so there is little risk to forest sustainability due to the age class substitution. The short term of the CP (two years) was also considered in this determination. However, the audit team has a concern regarding further/continued age class substitution on the Forest.

Recommendation 8: ARFMI must consider the harvest profile selected in the 2010-12 CP when developing the profile for the next FMP so that further substitution into younger age classes does not occur.

Direction regarding utilization in the 2010-12 CP was adapted from the *Northeast Region Operations Guide for Marketability Issues* (Apr, 2008). The Northeast Guide is considered a thoughtful resource for use by forest management planners to keep compliant with the Scaling Manual but there are issues with the amount of residual canopy considered acceptable under the Guide. In addition, there is no formal requirement to complete pre-harvest ground verification of forested conditions and the allowance for bringing unmarketable trees to roadside under the Guide could lead to loss of productive land.

Recommendation 9: MNR Region must update the *Northeast Region Operations Guide for Marketability Issues* document as follows:

- reduce the allowance for residual standing trees to no more than 25% canopy closure to better align the Guide with inventory standards
- incorporate a requirement to provide information, in addition to the current FRI description, to confirm actual stand conditions prior to finalizing operational plans
- clarify the allowance for bringing unmarketable trees to roadside in order to minimize the loss of productive area along roadways

The 2010-12 CP allows the leaving of up to 70 residual standing trees on all sites which is a considerable departure from the Guide direction - to leave between 25 and 50 residual trees on conifer sites. There is no rationale provided in the FMP for this deviation. Considering the Guide is the local resource used to aid in keeping utilization standards compliant with the Scaling Manual, the Guide direction should have been closely adhered to.

Recommendation 10: ARFMI must amend the utilization standards in the 2010-12 CP to be consistent with the Northeast Region Operations Guide for Marketability Issues document or provide compelling rationale for the significant deviation from that direction document. The 2012 FMP utilization standards should also conform to the Guide direction or provide rationale for departure.

Modelling for the 2010-12 CP included forecasting productive land losses due to waste wood fibre (i.e. slash). No conversion was modelled after 30 years as all roads were assumed to be in place and slash disposal methods (e.g. biomass utilization) were expected to reduce slash losses to 0%.

Considering minimal on-the-ground improvement has occurred in slash management over the past 30 years and much of the Forest is very remote, the audit team believes the model assumption of no slash losses after 30 years is overly optimistic.

Recommendation 11: The Abitibi River Forest planning team must consider on-the-ground results, current Provincial direction and the remote nature of a large portion of the Forest when modelling for productive land loss due to waste wood fibre in the 2012-22 FMP.

The 2010-12 CP includes modelling allowances and a corresponding slash management plan that, if fully implemented, would free-up about 108 ha of productive lands but also permits the conversion of significant amounts of forested land to non-forest condition. The slash planned to be left will be a considerable physical and chemical impediment to renewal of this productive Crown land. Significant amounts of unmanaged roadside slash were observed during the field audit (See Section 4.4). Recommendations related to recovering productive Crown forest land along roadways from waste fibre span the entire period since the beginning of the IFA process (1996) and were the subject of recommendations during the Forest Management Agreement (FMA) Reviews that predate the IFAs. These recommendations range across virtually every management unit in the Northeast and Northwest Regions and have typically been the subject of repeat audit findings. Recommendations have also been directed at Corporate MNR to provide clear direction on this subject. Despite this, MNR has only provided two somewhat ambiguous guidelines in the recently published Stand and Site Guide that will likely not lead to improvement in waste fibre management on Crown lands. Under current direction, the audit team believes that there will continue to be a significant long term loss of productive forest area to waste fibre.

Recommendation 12: Corporate MNR must develop a policy to address waste fibre management, consistent with the intent of minimizing losses of productive forest land, and provide associated direction to MNR regions, districts and the forest industry, including standards for acceptable allowances for conversion of productive forest land to non-productive forest land. MNR should also periodically report to the public the cumulative loss of area and growing stock potential due to forest land occupied by waste fibre.

According to company representatives there is a plan to increase in-bush chipping on the Abitibi River Forest in the near future. While in-bush chipping can reduce slash accumulation, chipper debris can become a localized issue; this has been observed by the auditors on several audits of management units in Ontario. There was no direction in the 2010-12 CP regarding management of chipping debris.

Recommendation 13: ARFMI must include direction regarding management of chipping debris in the next FMP.

A review of the AWSs was completed to assess the preparation of harvest, renewal and tending Forest Operation Prescriptions (FOPs). FOPs were found to be consistent with SGRs and were prepared in accordance with the FMPM. FOPs were confirmed to have been updated in the AWS for blocks which had changes to original prescriptions based on follow-up site visits.

Renewal

The 2010-12 CP silviculture ground rules (SGRs) were prepared in accordance with the FMPM and approved silvicultural guides and were consistent with the selected management alternative (SMA). A discrepancy was found between the modelled and planned silviculture program. According to the 2010-12 CP the planned overage in extensive activities during the two-year period was to be reconciled over the remaining eight years of the proposed ten-year plan (i.e. 2010-20 FMP). However, documentation and interviews indicate that a 2010-20 FMP is no longer scheduled; instead, a 2012-22 FMP is now being planned. Therefore the 2010-12 CP will become a stand-alone document and the deviation between modelled and planned renewal may not be reconciled. The deviation between modelled and planned renewal in the 2010-12 CP for the amalgamated forests, which select more extensive treatments than modelled, does not meet FMPM requirements.

Recommendation 14: ARFMI must consider the renewal profile selected in the 2010-12 CP when developing the profile for the next FMP and include sufficient analysis in the 2012-22 FMP to justify the significant deviation from the planned LTMD during the two year contingency period.

Silviculture support planned in the 2010-12 CP will meet planned renewal indicated in Table FMP-21 and planned planting/seeding densities. The current seed inventory is adequate to meet the proposed operations; however, two concerns related to silviculture support exist:

- The current first generation jack pine and black spruce tree improvement orchards are aging (currently about 25 years old); it will become more difficult each year to economically harvest seed from these sites. Plans to establish second generation orchards have been curtailed since 2004 due in large part to budgetary limitations. Failure to implement a succession strategy for the current seed orchards may lead to a significant shortage in available improved seed.

- Silviculture support planned would likely not support a more intensive program such as that modelled in the 2010-12 CP.

ARFMI should consider the longevity of current seed orchards and the likely needs of the Forest when determining seed requirements for future operations.

The plan text clearly identifies timelines for regeneration surveys for each forest unit and the assessment of not sufficiency regenerated or barren and scattered areas. Naturally regenerating conifer stands are surveyed six years post establishment to identify any required follow-up treatments. The assessment of Careful Logging Around Advanced Growth (CLAAG) areas for potential follow-up treatment is discussed; however, no survey timelines are defined in the plan. In addition, the plan does not address how artificially regenerated stands will be assessed for regeneration success and/or possible follow-up treatments prior to assessment for Free-to-Grow (FTG).

Considering the competitive nature of many upland sites on the Forest and the relatively low silviculture success during the audit period, it is suggested that ARFMI develop monitoring strategies that can determine the need for remedial action on artificially regenerated areas prior to assessing for FTG.

Table FMP-1 indicates 172,583 ha of Managed Crown Production Forest are below regeneration standards on the Cochrane Area Forest (49,407 ha are below regeneration standards on the former SRFF). Assuming harvest and renewal rates were relatively equal over the past several years this equates to about 17,000 ha that require regeneration surveying annually; however Table FMP-25 indicates an average of approximately 11,000 ha is to be surveyed over the two-year period. The 2004 FMPM expects that the amount of area assessed for regeneration success *"should be consistent with the level of regeneration success required to meet plan objectives and the management strategy as well as levels of past disturbance (i.e., harvest and natural)."*

Recommendation 15: ARFMI must review the planned renewal assessment program in the 2010-12 CP to ensure that the next FMP covers the existing shortfall.

A review of the AWSs was completed to assess the preparation of harvest, renewal and tending Forest Operation Prescriptions (FOPs). FOPs were found to be consistent with SGRs and were prepared in accordance with the FMPM. FOPs were confirmed to have been updated in the AWS for blocks which had changes to original prescriptions based on follow-up site visits.

4.4 Plan Assessment and Implementation

Plan Assessment

The Smooth Rock Forest consists mainly of lowland black spruce stands growing on organic soils overlaying clay. Sections of the Forest are located on upland features such as outwash plains, glacial tills and bedrock outcrops but these are uncommon. The current inventory is a reasonable approximation of the forest condition.

Site productivity over large portions of the Forest was noted to be quite variable due to nearness of the water table to the soil surface. Relatively small changes in elevation often led to significantly different forest types, even in very small blocks. This inherent variability was the cause of a significant audit finding related to careful logging in upland types. This is discussed within the renewal sub-section below.

Areas of Concern

The field portion of the audit included examination of a number of harvest blocks with AOCs to protect known values including water quality, remote tourism, a canoe route and a Provincial park. Examination from the air, on the ground and on supplemental aerial photography showed that AOC boundaries were maintained during harvesting operations. FMP and AWS direction was followed for the sample of AOCs viewed in the field and AOC prescriptions afforded appropriate protection to the values.

Harvest

A helicopter and ground transportation was used to access the field audit sites and GPS technology was used to confirm navigation to and within sites. During the field audit a variety of sites were viewed but the majority were lowland spruce types. Pre-harvest forest types included mainly conifer-dominated and some mixedwood stands. The field audit review included a selection of contractor work for each of the years audited. Due to the wet condition of most sites, the review was mainly of winter operations but several non-winter sites were also viewed.

Actual harvest levels were well below planned for the audit term due to the sector downturn, particularly following the shut down of the Smooth Rock Falls pulp mill. For the 2005-10 period 21% of planned harvest was achieved (3,734 ha of 17,371 ha). Harvest operations consisted of bringing full trees to roadside for processing. Roadside operations included round wood and pulp wood processing with in-bush chipping for pulp or bio-energy at a few sites near the Highway 11 corridor.

Good harvest boundary control was noted during the field audit but there were a handful of compliance inspection issues related to trespass earlier in the term; all involved minor AOC incursions. Use of GPS technology has improved boundary layout and decreased the size and frequency of incursions; there have been no trespasses documented since 2007. This is largely due to the use of GPS but is also due to the sector slowdown that caused a sharp drop in operations in the latter portion of the audit term.

Bypass of timber was minimized on sites viewed. Incidental merchantable pieces were noted in slash piles at some sites and merchantable stems used as pile ends were also noted at a number of sites but otherwise good to very good utilization was noted in most blocks; particularly in light of the small piece sizes in many blocks. Operators in the area are very proficient with careful logging techniques and as a consequence, little damage to residual trees was noted and site disturbance was minimized.

Due to tightening mill specifications Tembec requested and was granted approval to increase the lower harvest diameter limit in a few pilot areas during the term (i.e. allowance to leave 10-12 cm diameter trees standing). Application of this process was noted to be good since more black spruce seed trees were left behind and the residual standing trees were not damaged during removal of marketable stems.

There has been a relatively long history of waste fibre (i.e. slash) management issues in the area. The 2000-05 IFA for the SRFF recommended that Tembec ensure slash management through piling, piling and burning, or slash distribution be carried out wherever logging slash is accumulated. The audit action plan for the slash recommendation contained four action items that included developing a slash management strategy and establishing and monitoring slash management targets. Tembec developed a draft slash strategy, which was submitted in June 2008 as Amendment #9 to the 2005-10 FMP. The audit team found the draft strategy to be significantly deficient in meeting the slash management recommendation made in the 2005 IFA.

The 2005-10 FMP included limited information regarding the planned slash management program - "*redistribution of slash was to be explored*" (this was not done), otherwise "*priority was to be given to higher productivity sites and not all sites were to be piled or burned*". So, there was no commitment to manage slash on a majority of planned harvest sites (i.e. the lower productivity lowland spruce sites that dominate the area).

Although FMP direction was generally followed during the audit term, the slash management program delivered was not considered effective by the audit team and did not fully address prior IFA recommendations and action plans related to reducing slash on the Forest. Further, the audit team considers the slash management plan in the 2010-12 CP inadequate to minimize loss of productive Crown land and believes that it will not meet the intent of the related guidelines in the Stand and Site Guide.

Recommendation 16: ARFMI must ensure the slash management plan in the 2012-22 FMP can meet plan objectives and guidelines focused on minimizing loss of productive land. ARFMI should also deal with treatable backlog areas of slash.

Silviculture

Implementation of renewal activities during the 2005-10 term was assessed through field examination and document review to confirm compliance with the CFSA and the approved FMP.

The majority of renewal treatments viewed during the field audit were found to be consistent with the FOP and suitable to the site conditions; however, the audit team had concerns with operational practices that may lead to decreased silviculture success on select sites. These are discussed in detail in the following sections.

The bulk of silviculture activities on the SRFF were implemented during the first three years of the term. Lack of demand for forest manufactured products led to no harvesting being done in 2007 which led to significant reductions in silviculture activities near the end of the term. Tembec staffing resources dedicated to silviculture on the SRFF were significantly reduced in 2009 due to company budgetary constrains and the impending transition towards a shareholder co-operative management structure for the SFL in 2010.

During the audit period 3,734 ha were harvested and 4,228 ha were declared as being regenerated. Regeneration intensity was 42% extensive (i.e. natural renewal), 39% basic (i.e. some active regeneration undertaken to augment conifer composition) and 19% intensive (i.e. a suite of renewal activities undertaken to produce a conifer plantation). By comparison, the SMA silviculture intensity breakdown in the 2005-2010 FMP consisted of 61% extensive, 36% basic and 3% intensive.

Implemented silvicultural intensities where determined to be slightly different from planned levels in the FMP (Figure 3). Differences in implemented vs. planned extensive and basic activities are largely attributable to the pro-rated overachievement of planting and seeding initiatives. Silvicultural expenditures during the plan term were 63% of planned ($535,040 vs. $840,400).

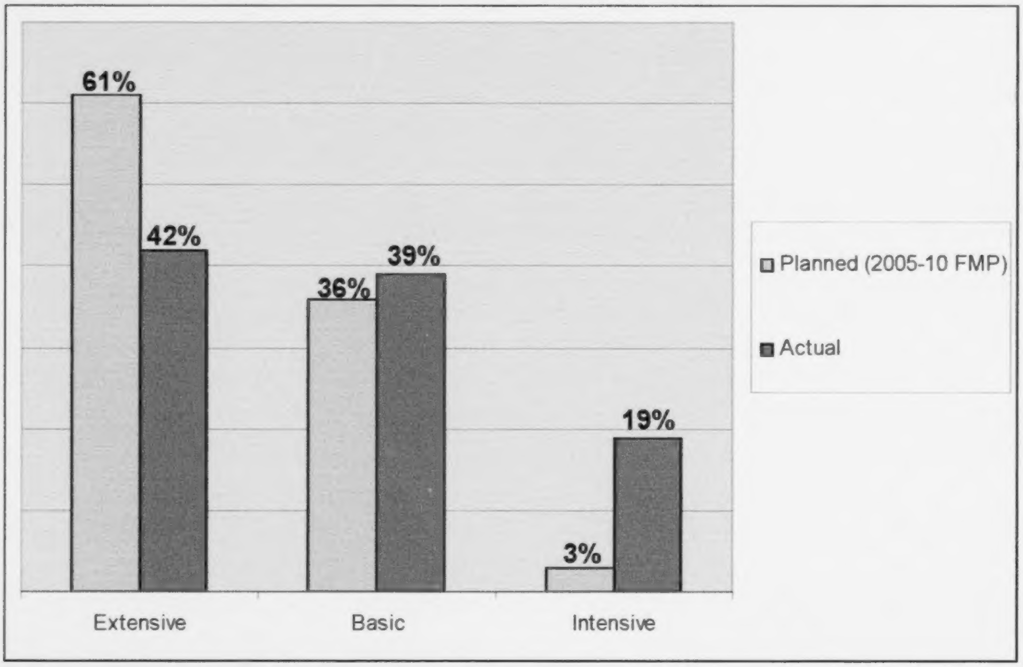

Figure 3. Planned vs. actual silviculture program

Natural Regeneration

Shortfalls were noted regarding the timely declaration of areas prescribed for natural regeneration. Section 4.6 includes a recommendation regarding underachievement in monitoring naturally renewing areas.

Several natural regeneration sites were viewed during the field audit to assess the effectiveness of the treatment. Careful logging techniques were implemented on almost all areas harvested during the audit term. This system consists of alternating travel and protection corridors with a focus on minimizing the area traveled by machinery and disturbance to existing regeneration.

CLAAG and Harvesting with Advanced Regeneration Protection (HARP) are well suited to most of the lowland sites that dominate the area and were found to have sufficient advanced regeneration spruce in the leave strips while site impact within harvest corridors was minimized, thus providing the requisite microsite for natural seeding or potential fill planting.

Careful logging viewed on most upland sites was deemed to be ineffective. Little advanced growth was present to protect in some areas and shrubs now dominate. In other areas regeneration mainly consists of balsam fir, balsam poplar and birch – species that are less desirable than the spruce and aspen harvested. The *Silvicultural Guide to Managing Black Spruce, Jack Pine and Aspen on Boreal Forest Ecosites in Ontario* deems the use of natural advance growth as NR (not recommended) for certain upland ecosites, and requires the implementation of silvicultural exceptions monitoring where it is employed. Considerable active renewal through chemical and/or mechanical site preparation, planting and tending will be needed to meet regeneration standards on some of these sites. Other sites will naturally renew to less desirable species. The 2010-12 CP SGRs no longer permit CLAAG or HARP on upland sites; however there is now a compliment of upland sites treated in this manner that will regenerate to poor quality stands unless remedial treatments are undertaken. Some sites will be too expensive to treat; however the effort should be made to identify and treat those sites where it is practical to do so.

Recommendation 17: ARFMI must:

c) conduct an immediate review of all upland sites harvested under the Careful Logging Around Advanced Growth system since 2005 and implement remedial silvicultural treatments, where practical, on sites found not likely to become a silvicultural success
d) implement exceptions monitoring on all upland Careful Logging Around Advanced Growth sites for which the use of natural advance growth (without planting) as a regeneration method is deemed as not recommended under the Silvicultural Guide.

It was evident through both field observations and a review of documents that larch is becoming more prevalent in some stands. Unmarketable, mature larch trees retained on cutover areas are effectively acting as seed trees and contributing to an increase in the larch component of regenerating stands. Some transition from SBC (black spruce CLAAG forest unit to LC1 (lowland conifer forest unit) is planned for in FMP modelling; however, as evidenced by annual reporting, the Trend Analysis Report (TAR), and audit findings, SBC sites are becoming LC1 at much higher rates than predicted due to increased larch content.

In addition, and as discussed previously with regards to careful logging and regeneration protection on upland stands, the increased presence of other less desirable tree species such as balsam fir, balsam poplar and larch is common. The main issue, and source of the audit team's concern, is that transition of significant amounts of area from forest units dominated by preferred tree species to those with less preferred tree species is a threat to forest sustainability.

Recommendation 18: ARFMI must address the increased presence on the Forest of less desirable tree species such as larch and balsam fir.

A group seed tree natural prescription was also viewed during the field audit (Webster 13). It was determined that group seed trees were adequately dispersed throughout the cut block and that the site conditions were well suited to natural black spruce seeding. Prolific germination of black spruce seed was observed throughout the block and the FOP was determined to be well suited to the observed field conditions.

Planting and Seeding

During the term, 30% of the planned area for planting was treated (1,958 ha) of which 264 ha were deemed as being supplementary treatments for naturally regenerating blocks with low stocking. Declared planting area exceeded the pro-rated FMP targets (1,361 ha) by 44% based on actualized harvest area during the term (21% of planned).

A total of 2.65 million trees were planted during the term on 1,958 ha – an average density of 1,354 trees/ha. Lower than planned planting densities (1,800 trees/ha) are largely attributable to CLAAG harvesting pattern being applied to areas prescribed for artificial regeneration, reducing total available planting spots per hectare through the retention of advanced growth. Concerns over the use of CLAAG harvesting patterns on upland sites are addressed in Recommendations 17 and 18.

Overall planting quality on the SRFF was determined to be sufficient to meet the minimum regeneration standards of the FOP and the direction of the FMP. Due to the predominance of clay soils on the unit there is a reluctance to use mechanical site preparation and direct planting is preferred. Direct planting can often result in lower densities due to planters having difficulty finding suitable planting spots and planted trees quickly succumbing to heavy competition. Field audit findings included inconsistent planting densities, overplanting in sites with high spruce seeding potential and planting outside of the prescribed planting boundary.

Inconsistent seedling spacing is also normally found in directly planted areas and this was evident at a number of audit stops. Tembec has clear and detailed work instructions in place related to seedling stock handling, screefing, finding suitable planting microsites and operational safety for planters; however many sites are not conducive to direct planting, particularly if there is excessive harvesting slash or duff. In these cases ARFMI should consider the use of site preparation to increase available microsites for planting.

Aerial black spruce seeding operations exceeded planned levels by 73% during the term (502 ha actual vs. 285 ha planned). Areas viewed where found to be consistent with the FOP however some sites were observed as having low germination success due to less than ideal microsites and advanced deciduous competition.

Site Preparation

Aerial glyphosate application was the predominant method of site preparation on the SRFF with 618 ha treated during the term (394% of planned). Mechanical site preparation was not conducted on the SRFF despite 120 ha being planned in the FMP. Chemical site preparation (CSP) operations were found to effectively reduce competing vegetation so as to promote proper seedling establishment and survival. Under a CSP regime seedling microsite quality and quantity is entirely dependant on the individual planter. Planting quality issues were noted during the field audit.
The company contends that the limited use of mechanical site preparation was due to the following:

> The predominance of clay soils types which have a tendency of heaving seedlings from the soil during the frost period.
> Sites which were prescribed for planting during the term had low levels of duff and/or debris

Increased potential for seedling heaving may be true when using traditional scarification tools (power trenching, deep blading); however, intermittent patch mounding in heavy clay soils has been proven in many jurisdictions and provides many quantifiable advantages compared to direct planting (decreased heaving, deciduous competition control, raised microsite, increased nutrient availability/seedling growth, etc.).

Properly implemented site preparation provides planting spots of the quality and quantity needed to meet regeneration standards. It is suggested ARFMI consider the use of alternate site preparation tools to maximize site productivity and increase planting densities in areas with thicker duff layers; this could also allow for decreased herbicide use, particularly in areas prone to invasive grasses.

Slash piling was conducted on the SRFF during the first two years of the FMP. Planned area targets of 1,058 ha for piling were underachieved by 80% during the audit term (204 ha piled). Underachievement of slash piling activities was due to reduced harvest levels, some use of slash for bio-energy and program curtailments from 2007-2010. See Recommendations 12 and 16.

Tending

A representative sample of tending operations that occurred during the term was examined for effectiveness in the field. Related documents were also reviewed to assess compliance with regulations and planned operations. During the audit period, 97% (6,700 ha) of the planned area for tending was treated. Tending activities included treatment of 1,227 ha of barren and scattered and not sufficiently regenerated lands. Tembec implemented tending operations on 538 ha of Z class lands (met minimum stocking standards and only needed deciduous competition control to reach free growing status). Remaining Z class lands on the SRFF total 2,714 ha.

Tending during the audit term consisted of aerial application of herbicide; no manual tending was done. The chemical products Vision and Forza were used on the Forest. Due diligence was followed by the company to ensure compliance with all relevant rules and regulations of chemical application. Tending blocks viewed during the field audit revealed operational implementation issues with respect to the following findings:

- Poor chemical efficacy was evident in blocks treated at the beginning of the term requiring re-treatment (e.g. block AS-56).

- Some spray blocks showed evidence of residual overspray, striping and missed areas (e.g. block AS-100)

Spray issues were confirmed by MNR during interviews, in annual silvicultural effectiveness monitoring reporting and FOIP reports. Noted implementation issues were found to be predominantly aggregated near the beginning of the term (2005-2007) with better implementation found in blocks treated near the end of the audit period

In 2007 Tembec implemented a regional program to identify ongoing spray effectiveness issues and develop actions to address them. The program was found to be comprehensive in terms of addressing past operational deficiencies while increasing requirements for operational controls and staff/contractor training and awareness. Additionally, joint annual reviews of MNR silviculture effectiveness monitoring findings has helped Tembec identify spray program issues and develop appropriate strategies to address them. Tembec has acknowledged issues with the chemical spray program and suggested that plant drought condition may be correlated to glyphosate efficacy; this is to be investigated through the Forest Research Partnership. It is suggested that ARFMI continue research into factors affecting chemical efficacy.

Renewal Support

Tree improvement activities, seedling production, cone collection and available seed inventory was examined during the audit. Orchard maintenance activities were the only tree improvement activities conducted during the audit period. Seed and planting stock production and seed inventory levels during the term were consistent with forecast levels in the FMP.

Access

A number of roads were examined during the field portion of the audit. Included in the review were construction/maintenance activities, general road location and layout, water crossing installations and water crossing removal and rehabilitation. Much of the Forest is poorly drained with large expanses of low lying flat organic sites. At the time of the field audit, considerable rainfall had occurred in the area; ditches were full to overflowing and high water levels were evident throughout the area.

The forest includes large peat swamps scattered throughout with the largest proportion found in the northern part. In these areas, road construction techniques relied on excavating material from ditches and placing it on the road right-of-way to form the road base. This technique differs considerably from one where material is brought in to form a road base on top of the root mat.

The field audit included a fly-over of the Marceau Road. The 20.9 km road is located in the north eastern part of the Forest and was constructed in an area of poorly drained and wet organic soils with extensive flats of black spruce. The resulting feature appeared as a significant barrier to summer movement by woodland caribou.

Although woodland caribou use of the area was known through the caribou research study, Amendment #3 in the 2006-2007 AWS includes no consideration of caribou in its Use Management Strategy. Since no timber harvesting has taken place and since caribou use of the area has been recorded, it is necessary that a Use Management Strategy that considers caribou use of the area be developed.

Recommendation 19: ARFMI must develop and implement a Use Management Strategy for the Marceau Road following direction in the 2009 FMPM; the strategy must be informed by the *Endangered Species Act, 2007.*

Water crossing installations and removals were found to be well done. Consistent use of long culverts afforded extra length for good bank sloping and fill coverage over the structures.

Aggregate pits were also found to be in accordance with relevant standards.

4.5 System Support

Ontario's forest management system is based upon timber revenues, which declined significantly during the audit term due to the sector collapse and broader global economic decline. Financial challenges faced by the SFL holders led to high rates of attrition and companies faced unprecedented demands to restructure. Given these circumstances, the professionalism of remaining staff prevented a complete collapse of the forest management system.

The audit team has some concerns about the adequacy of the system support in place during the term of the audit. System and staffing support issues where determined to be a primary contributor to the key audit finding relating to silviculture monitoring (see silviculture monitoring section). During the field audit it was evident that silvicultural records were incomplete and poorly organized, raising concerns about the completeness of records transferred to the new manager. A review of some of the systems and issues associated with the challenges of amalgamation is recommended in Section 4.1 (see Recommendation 5)

FRMG, a newly formed company contracted by ARFMI to deliver forest management services on the Abitibi River Forest, is based upon the systems and personnel associated with the Timiskaming Forest Alliance Inc. which has a proven management track record. Time will tell how well these new systems will work in the new environment. To assist in the transition, the audit team suggests that ARFMI continue its efforts to capture local experience and knowledge in the new management systems being developed by FRMG. As an example, several foresters, retired or operating as independent contractors, were retained by ARFMI to assist in field portions of the audit. This proved to be effective and efficient in facilitating the audit.

It is MNR's responsibility to manage the public consultation process for forest management plans and amendments, including preparation of public notices and maintenance of adequate records. In addition to the missing required information associated with the content of the public notice for Amendment #8 (see Recommendation 3), only the records of the notices sent to Aboriginal communities and organizations could be located; records of notices of the amendment to other potentially interested groups and individuals could not be located.

Recommendation 20: MNR must establish record keeping procedures that ensure maintenance of public notice records for all amendments.

4.6 Monitoring

Silviculture

Tembec's entire silviculture effectiveness monitoring (SEM) system was evaluated during the audit. The focus was on determining whether the system allows for monitoring the effectiveness of all silvicultural treatments, identifies areas in need of remedial actions and determines conformance of operations to the selected management alternative of the FMP. It was determined that Tembec has comprehensive silviculture monitoring policies and procedures in place. The program includes pre-harvest surveys and post-harvest/CLAAG surveys, informal tending surveys and FTG assessment.

The intent of these surveys was to help determine pre-harvest stand conditions, advance growth potential, confirmation of the appropriateness of the initial FOP and appropriate harvesting method (CLAAG, Group Seed Tree, and Conventional Harvest). Post-harvest/CLAAG surveys were used to identify areas where residual advanced growth will not result in meeting minimum renewal standards and where remedial silvicultural treatments will be required. Silvicultural monitoring activities were conducted on the SRFF from 2005-2007. Subsequent monitoring on the SRFF was curtailed due to budgetary and staffing constraints.

It was noted that very few changes to the prescribed FOP and harvesting method were made subsequent to information gathered during pre-harvest assessments. A recommendation addressing concerns over CLAAG harvest patterns being used on upland sites is included in the implementation section of the audit report

At the time of the field audit, none of the staff who directly managed the silviculture program were still employed by the company so information regarding the monitoring program implemented during the audit term was limited. According to available Tembec staff, monitoring issues were due to the significant sector downturn that led to budgetary restraint and loss of field staff. During interviews and in SEM documents MNR expressed concern, particularly later in the audit period, over reduced company staffing available to effectively deliver and monitor the silviculture program. Issues relating to silviculture staffing and system support appear to have been addressed by the service provider (FRMG) who currently administer forest management services on behalf of the SFL holder (ARFMI).

During the term 16% (1,768 ha) of the planned area for natural regeneration was declared in the ARs. Declared naturally regenerated areas were consistent with planned levels (adjusted based on actualized harvest) however, naturally regenerated areas were only declared in 2005 (1,529 ha, 86%) and 2006 (239 ha, 14%). Company interviews indicated that the majority of the areas declared in 2005 would have been harvested in the previous term and that budgetary and staffing constraints led to the curtailment of post harvest surveys near the end of the term (no harvest in 2007-08). Based on a forecast of natural regeneration pro-rated to the actualized harvest level (2,287 ha) and the discounting of areas declared in 2005 (1,529 ha) there was a significant underachievement in areas declared naturally regenerated (10% of pro-rated planned). Post harvest survey under achievement is highlighted in the TAR; *'Increased reliance on natural regeneration was forecasted for the 2005 FMP however there has not been enough survey work completed yet to confirm this estimate.'*

Recommendation 21: ARFMI must address the backlog of areas that require assessment of natural regeneration.

During the audit term 38% (6,435 ha) of the planned area for Free-to-Grow assessments where surveyed. Budgetary and staffing constraints led to several monitoring implementation shortfalls near the end of the plan period. Due to the predominance of winter access sites on the SRFF, extensive aerial surveys were used for all FTG surveys. Active participation of MNR staff was noted and the majority of the surveys completed were performed jointly between Tembec and MNR staff.

Recommendation 22: ARFMI must address the current backlog of FTG surveys on the Smooth Rock Falls Forest.

Areas surveyed were consistent with areas listed in the approved FMP and AWS. A representative sample of areas declared successfully regenerated was viewed during the field audit and actual FTG calls were compared to field observations. Species and stocking calls audited were found to be generally consistent with the inventory data. The audit team identified some discrepancies with respect to species composition and stocking; however, the overall accuracy of the FTG data for areas sampled was found to be satisfactory. In addition, FTG field tally sheets were compared for consistency with inventory information to check for data transfer errors; none were found.

FTG data shows that 90% (5,785 ha) of the areas surveyed are considered a regeneration success - meeting minimum stocking and species requirements but not the intended forest unit. Silvicultural success - meeting minimum stocking and species requirements as well as the desired forest unit – was achieved on 55% of the areas surveyed. The data indicated a shift towards an increase in hardwood leading FUs (34%) and LC1, SF1 & SP1 FUs (227%) while SB1 (black spruce rich) and SB3 (black spruce poor) FUs are decreasing (35%).

A key contributing factor to this FU shift is the broad scale application of CLAAG harvesting techniques on upland sites leading to the retention of balsam fir, larch, aspen and birch advanced growth within the leave strips. Recommendations 17 and 18 address the implementation of careful logging techniques on upland sites.

MNR implemented a comprehensive SEM program during the audit term. The 2005, 2006 and 2007 FTG submissions were assessed by MNR staff using intensive ground methods as well as aerial surveys to achieve the desired sample size (minimum of 10%). MNR assessment results were compared to company submissions and discrepancies and trends were clearly presented in SEM reports. SEM results were presented to Tembec annually and action plans were developed accordingly. MNR's SEM work during the audit term was determined to be excellent and is deemed a best practice. The audit also determined that MNR completed outstanding work with regards to compliance monitoring (see Monitoring Section). This Best Practice has been developed to recognize both of these areas of excellence.

Best Practice 2: The monitoring of silviculture effectiveness and compliance by the Ministry of Natural Resources during the audit term was deemed to be excellent.

Compliance

Tembec produced a strategic Compliance Plan for the 2005-10 FMP. A strategic Compliance Plan was also developed for the 2010-12 CP for the amalgamated forests. These documents were approved well in advance of operations commencing. The compliance plans were well written and met all requirements including a description of compliance goals, priorities and strategies as well as reporting responsibilities.

Annual compliance plans were also produced by Tembec for each AWS during the audit term noting compliance priorities, etc. and listing all operations by block number. The block lists included values by AOC code, forecast start date by season, company responsible, the need for 'in progress' reports and information regarding timing of startup notifications and completion reports.

MNR did not have a District Compliance Plan during the audit term but these were no longer a requirement in this period. MNR completed an Annual Compliance Operating Plan (ACOP) for each year during the audit term. The ACOPs reviewed were well written and contained a comprehensive forestry section that discussed goals and compliance priorities. AWS planned compliance activities are prioritized through a ranking system developed by MNR. All known non-compliant activities and public complaints were also targeted for inspection.

The ACOPs were to be reviewed quarterly by MNR to determine progress. Some of the reviews were informally done and were not documented but more formal reviews were done at least twice a year, including a six-month and year-end summary. District Compliance Advisory Team meeting minutes captured the six month review notes while a year-end summary was produced to describe actual compliance activities that took place.

MNR also has a "Compliance-at-a-Glance" worksheet that links start-up notifications with monitoring targets by block. The worksheet was also used to keep track of inspection status and issues. This is deemed a very good resource for the inspectors.

Review and dispersal of compliance information was completed through two forums:

- District MNR compliance staff met quarterly as the Forest Advisory Team.
- Joint industry/MNR compliance meetings occurred as needed

These forums provided for necessary dissemination of information and discussion regarding compliance.

In addition, an inter-district protocol was developed to define the roles and responsibilities of the three MNR districts that service the Abitibi River Forest. The protocol was well conceived and pertinent portions regarding MNR roles/responsibilities should be brought into the next Abitibi River Forest FMP to provide clarity and connectivity between these documents.

According to the compliance plans Tembec was responsible for completing compliance inspections on their operations, OLLs were required to be compliant and MNR was to spot-check and audit operations and reports. The audit team reviewed compliance reporting and confirmed that the responsible parties completed inspections and other requirements according to this arrangement.

Company compliance reports viewed were generally timely and included required text regarding observations. It was noted that pictures/scanned maps, etc. were not normally included in company reports. Although not required, these visual aids can add perspective/clarity and should be considered for inclusion in future reports. MNR reports viewed were comprehensive and included digital pictures and scanned maps as necessary to aid in discussing inspection findings. However, MNR reporting was often tardy. MNR has a protocol in place that requires inspectors to provide the District Supervisor with a form for each late report that notes the number of days the report was late as well as reasoning for lateness. MNR has listed tardy reports as an area in need of improvement in the most recent version of the ACOP, therefore no recommendation is made in this audit.

On-the-ground joint inspections rarely occurred during the audit term. While the joint office meetings provide a good forum for discussing compliance, joint on-the-ground meetings are most effective for discussing actual operational issues, etc. MNR has also determined that joint inspections should be encouraged and has listed this as an area in need for improvement in the ACOPs. The audit team concurs but since this is already identified as needing improvement, no recommendation is made.

Industry and MNR inspectors completed 148 inspections during the audit term; industry completed 109 and MNR 39. The number of inspections completed was determined to be satisfactory based on the reduced level of activity during the audit term. MNR's rate of identifying non-compliance was significantly higher than the company rate (18% vs 6% for actual non-compliant activities). Through a review of reports and interviews with MNR and industry staff it was determined that company inspectors tend to use 'in compliance with comments' more than MNR and this may be one reason there is a large discrepancy in reported compliance status.

Recent changes to the compliance program remove the requirement for the industry or MNR inspector to make a specific determination of compliance versus non-compliance and instead focus on operational issues found. How these issues are managed will determine the compliance outcome. Compliance status will be determined by the presence or absence of operational issues and, where operational issues are identified, by the outcome of the MNR led issue management process. Therefore, the changes made to the compliance program will reduce/eliminate the variability in reporting of compliance so no recommendation is made in this audit.

Non-compliance during the term included minor trespasses into AOCs and some roads issues including erosion, problems with ditching and cutting of road corridors outside of the designated area. Some utilization and licensing issues were also found. A few silvicultural non-compliances also occurred related to tending outside of approved boundaries. Most of the non-compliant operations found during the term were classed as minor, a few as moderate and one as significant.

When operations were suspended during the audit term for a period greater than 20 working days, suspended operation reports were completed but the duration of a few suspensions and the content of suspension reports was found to be an issue. According to FOIP as of early October 2010 there are 13 suspended reports; based on April 1, 2008 Compliance Handbook direction, three reports over two years old are overdue. Several other suspended reports lack required detail. For example, report #341674 simply notes that operations are suspended - reasoning for suspension and a timeline for completion of operations are not provided. More recent suspension reports include reasoning for suspension and a timeline to complete operations so no recommendation is made in this regard.

The most important issue with the 'extended' suspension reports is the significant delay of required silviculture treatments that may have occurred while awaiting completion of harvesting, hauling or other operations. As of April 1, 2010 suspension reports are no longer required; however, the overdue suspension reports discussed above need to be dealt with appropriately to determine the renewal status of these blocks and identify any required treatments.

Recommendation 23: MNR must conduct spot checks on the outstanding suspension reports and determine any compliance action to be taken.

According to records and interviews Tembec delivered an effective prevention/education program during the audit term. Tembec's program is based on the ISO 14001 and FSC certification framework, which have rigorous requirements regarding developing, delivering and documenting prevention and education programs. Tembec staff was found to be well trained.

MNR also delivered an effective prevention/education program for staff during the audit term. Staff are well trained and effectively completed required tasks. The thorough, well-conceived compliance monitoring protocols put in place and being implemented by MNR demonstrates the competence of the staff.

Annual Reports

Annual reporting during the audit term was fairly well done. The ARs were generally well written, numbers in text and tables were typically in agreement and 'to date' summaries were usually correct; however there were some variances between text and tables. The variances were small and not considered significant to warrant a recommendation.

The ARs showed silvicultural success rates as low as 45% in 2007 and as high as 87% in 2005 with a cumulative rate of 60% at the time of amalgamation with the CMRMU. In the FMP, based on the intensity and silviculture treatments planned, multiple pathways are available and modelled to allow current forest units to become a number of future forest units. In Tables AR-13 and 14 only a one-to-one relationship is reported. Thus, in the audit team's view, there is an issue with the use of multiple-pathway modelling for the FMP and single-pathway reporting in these AR tables. This discrepancy will lead to a breakdown in the adaptive management cycle since results being tabled in ARs cannot inform the planning team for the next FMP. In addition, low silviculture success ratios currently derived by the reporting format may send the wrong signals to policy makers and the general public.

Recommendation 24: Corporate MNR must review the reporting procedures and consider modifying them to recognize multiple successional pathways to improve the adaptive management process.

4.7 Achievement of Management Objectives and Sustainability

Trend Analysis Report

FRMG prepared the Trend Analysis Report (TAR) for the SRFF. The audit team reviewed the report and noted some deficiencies; FRMG submitted a revised report. Some data in the final TAR contains minor differences in reported values compared to those in the ARs but the differences are not considered materially significant. Otherwise the TAR generally met IFAPP requirements. The TAR covered the years 1990-91 to 2008-09. The TAR accurately notes that changing forest units from plan to plan make establishing meaningful trends difficult.

Undercut, in terms of harvest area was experienced in all terms covered by the TAR; harvest area ranging from a low of 26% (current term) to a high of 81% (1995-00). With the exception of the 1995-00 term, there was an overall significant underutilization of the available volume due to reduced harvesting activities. Renewal and maintenance activities operated at less than planned levels due in significant part to reduced harvest levels. Artificial regeneration ranged from 30% to 75% of planned and tending closely approximated planned levels. There were some issues with timely reporting of natural regeneration. Based on data covering the 1990-95 harvest term, regeneration is generally keeping pace with harvest depletion at approximately 11,600 ha regenerated from approximately 14,700 ha cut (89%). Data from the first four years of the current 2005-10 term indicates silvicultural success rates by forest unit ranged from 39% to 67% while regeneration success ranged from 73% to 100% on a total harvest area of approximately 6,500 ha.

The TAR author found that plan objectives for the 2005-10 FMP were generally met. Some conclusions are based on modelled outcomes being within acceptable tolerances (e.g. forest diversity) while others were based on following guideline requirements during plan implementation. The TAR author concluded, while acknowledging data limitations for some indicators, that ...*implementation of planned operations has provided for the long-term sustainability of the Crown Forest.*

This conclusion was largely based on the following reasoning:

- most of the objective achievements are within, or moving towards the deirable levels for the indicators;
- all forest diversity objectives are within target ranges
- the socio-economic indicators for wood supply achievement are not at the desirable levels; however long term demand for forest products is predicted to continually increase
- renewal operations have been consistent with harvest levels
- all forest diversity indicators are at acceptable target levels
- total managed Crown forest available for timber production has been maintained
- majority of actions to address the 26 audit recommendations from the 2005 IFA have been completed or have started and are ongoing

Achievement of Management Objectives

Of the 25 objectives set in the 2005-10 FMP the audit team considers 15 to be fully met, nine partially met and one not met. The objective that was not met dealt with implementation of a program to reduce slash. The actual amount of area of slash piling fell far short of the area committed to. In addition, the slash management toolkit that was to be developed was not. The issue of slash occupying productive forest land contributed to the partial achievement of two other objectives. A complete list of objectives and the audit team's assessment of their achievement is contained in Appendix 2.

Forest Sustainability

On balance, and despite the ongoing issue of slash management, forest sustainability (i.e. achieving plan objectives and the long term management direction set for the Forest in the FMP) is being achieved. Habitat is being maintained at planned levels, habitat needs for species at risk are being addressed, and non-timber values are protected. Compliance to legal requirements is being met. The economic slowdown in the forest industry and the consequent reduced harvesting level has had a negative financial impact, although this situation is likely cyclic and expected to improve. Overall regeneration is keeping pace with harvest levels. An increase in less desirable trees species was observed on upland sites where careful logging was used. Both MNR and Tembec have worked proactively with area Aboriginal communities to build relationships and identify opportunities for Aboriginals to benefit from forestry activities. The public continues to be involved, in particular through the work of the Local Citizens Committees.

4.8 Contractual Obligations

All contractual obligations arising from the SFL were fully met with the exception of the following:

- Audit action plan and status report – partially met
- Silviculture standards and assessment program – not met

Recommendation 25: The Cochrane District Manager must ensure that submission timelines for IFA Action Plans and Status Reports are met.

The previous IFA made 26 recommendations, including licence extension. The audit action plan contained multiple actions to address the recommendations. The audit team concurs with the audit action plan status report that most of the actions are fully completed or are ongoing and have addressed the intent of the recommendations. The audit team does not consider Recommendation 12, dealing with slash management, to have been adequately addressed.

4.9 Conclusions and Licence Extension Recommendation

There are three areas of concern arising from the audit that are considered key since they highlight the need to significantly alter certain current practices on the Forest in the interest of sustainability. The first area of concern arises from the lack of clear direction from the Province that has allowed forest operations to leave significant amounts of waste wood fibre (slash) at roadside where it occupies productive forest land and prevents establishment of regeneration. This practice is not unique to the SRFF or the amalgamated Abitibi River Forest; management of waste wood fibre (both slash and chipper debris) has been a recurring issue for years as evidenced by the many recommendations made in previous IFAs across Ontario. Only a change at the Provincial policy level, supported by forest management plan commitments and enforcement of such commitments through the Provincial compliance program is likely to lead to an effective, permanent solution. The second area of concern is associated with implementation of harvesting patterns that protect existing regeneration on upland sites. This practice is leading to degrading of future stand composition through retention of less desirable species that will form a higher component of the new stand, and reduced productivity due to the inherently higher levels of competition on upland sites resulting in lower stocking levels. A third related area of concern is the retention of mature larch seed trees in harvest blocks which is also contributing to a significant increase in the larch component on lowland sites as well.

The audit team concludes that management of the Smooth Rock Falls Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and the Forest was managed in compliance with the terms and conditions of the Sustainable Forest Licence held by Tembec Inc. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol.

No recommendation is made on licence extension since a new licence with a twenty year term was issued to Abitibi River Forest Management Inc. for the Abitibi River Forest in August 2010. A recommendation on licence extension will occur at the next IFA.

Appendix 1 – Recommendations

Independent forest Audit – Record of Finding

Recommendation 1

Principle: 2. Public Consultation and Aboriginal Involvement

Criterion: 2.1 Local Citizens Committee (LCC)

Procedure: Assess establishment of the LCC. This will involve a review of the terms of reference and LCC minutes, compared to the applicable FMPM requirements.

Background Information and Summary of Evidence:
The 2004 FMPM requires that the LCC Terms of Reference be prepared (or updated for an existing committee) at the beginning of Phase I planning. The Cochrane LCC Official Terms of Reference (updated in March 2006, March 2007, March 2008 and January of 2009) was reviewed. Section 3.2.4 of the 2004 FMPM lists content requirements for the Terms of Reference for the LCC. The following items were either not included or not adequately addressed in the Terms of Reference for this audit period:

- Item (a) – the name of each committee member and his/her affiliation
- Item (b) – the date of each member's appointment to the committee
- Item (c) – the roles and responsibilities of the committee, and individual committee members, including how each committee member will report back to and/or obtain input from the constituency he or she represents
- Item (i) – background material and training required to assist committee members with their roles and responsibilities and forest management planning matters

Discussion:
The LCC terms of reference form part of the public record. It should be an accurate snapshot of the committee at the time it is updated and meet the requirements of the FMPM. Much of the content required by the FMPM also serves to aid the committee members in fulfilling their roles and responsibilities to the committee, particularly for new members.

Conclusion:
The LCC Terms of Reference do not currently meet the content requirements of the FMPM.

Recommendation 1: MNR must ensure that the LCC Terms of Reference are updated to meet the content requirements of the FMPM.

Independent Forest Audit – Record of Finding

Recommendation 2

Principle: 2. Public Consultation and Aboriginal Involvement

Criterion: 2.2 FMP Standard Public Consultation Process

Procedure: 1. Review and assess whether the public consultation processes for the plan and any amendments met the requirements of the applicable FMPM and whether the process was effective.

Background Information and Summary of Evidence:
The process and requirements for providing notifications to the public and Aboriginals were generally followed. However, Notice of Review of the Approved Amendment #4 (major), dated Sep 20, 2007, was issued prior to approval by the Regional Director dated Oct 4, 2007. The 2004 FMP requires: "After approval by the MNR Regional Director, the MNR approved major amendment is available for inspection at Stage Two of public consultation and Aboriginal involvement, as described in Part C, Sections 6.3.3 and 7.3.2."

Section 6.3.3 of the FMPM states "Stage Two of public consultation will begin by issuing a public notice which invites the public to inspect the MNR-approved major amendment. The public notice will be issued upon approval of the major amendment by the MNR Regional Director."

Discussion:
The FMPM defines the process for issuance of public notices, including the requirements for MNR approvals and the timing of release of the notices.

Conclusion:
MNR did not meet the timing requirements for release of the Stage 2 public notice for Amendment #4.

Recommendation 2: MNR must ensure that the approval process for public notices meets the requirements of the FMPM.

Independent Forest Audit – Record of Finding

Recommendation 3

Principle: 2. Public Consultation and Aboriginal Involvement

Criterion: 2.2 FMP Standard Public Consultation Process

Procedure: 1. Review and assess whether the public consultation processes for the plan and any amendments met the requirements of the applicable FMPM and whether the process was effective.

Background Information and Summary of Evidence:

The process and requirements for providing notifications to the public and Aboriginals were generally followed. However, public notice letters associated with Amendment #8 (minor) did not contain the following information required by Part C, Section 6.1.1 of the 2004 FMPM:

(b) a statement that further public consultation may be required if concerns are raised;
(c) a statement that the minor amendment will receive final MNR approval by a specified date if no concerns are raised;
(d) a brief explanation of how comments which are received will be handled under relevant provisions of the *Freedom of Information and Protection of Privacy Act*, and
(e) a statement of the opportunities for resolution of issues (Part C, Section 6.1.4).

Discussion:
The FMPM defines the process for issuance of public notices, including content requirements.

Conclusion:
MNR did not fully meet the content requirements for the public notice associated with Amendment #8.

Recommendation 3: MNR must ensure that public notices meet the content requirements of the FMPM.

Independent Forest Audit – Record of Finding

Recommendation 4

Principle: 3. Forest Management Planning

Criterion: 3.1.2 Planning Team and Advisory Groups

Procedure: Assess the effectiveness of the Planning Team and advisory groups

Background Information and Summary of Evidence:
A review of the 2010-12 CP and Supplementary Documentation, interviews and questionnaires determined that FMPM procedures were followed but the Planning Team encountered delays in meeting some checkpoints (i.e. planning inventory and base model) early in the planning process for the 2010-20 FMP. These delays and concern over the implementation of the pending Caribou Conservation Plan under the Endangered Species Act (2007) led to a determination by the Steering Committee that a Contingency Plan would be required.

Discussion:
The reasons for going to a Contingency Plan were properly documented in the Contingency Plan proposal; however, the Steering Committee only met twice, contrary to the Terms of Reference which called for quarterly meetings. No minutes were recorded for those meetings. There is a need to improve communication between the Planning Team and Steering Committee in future planning efforts. For example, two planning team members were not certain why a contingency plan had been called for late in the planning process

Conclusion:
The Steering Committee plays an important role in the planning process and minutes of meetings and correspondence should be maintained and included in the Supplementary Documentation section of the FMP. The audit team believes that there is a need to improve communication between the Planning Team and Steering Committee in future planning efforts.

Recommendation 4: MNR must ensure that the Steering Committee meets as required during the development of the 2012-22 FMP and that minutes for those meetings are recorded, distributed to planning team members and included in the FMP supplementary documentation.

Independent Forest Audit – Record of Finding

Recommendation 5

Principle: 3. Forest Management Planning

Criterion: 3.3 Management Unit Description

Procedures: 3.3.3.1 – 3.3.5.1 The IFAPP devotes eight criteria and 13 procedures to the assessment of the management unit description section in an FMP.

Background Information and Summary of Evidence:
The CP was prepared consistent with the approved Proposal's table of contents that excluded the forest management unit description section. The previous CP for the CMR had a forest management unit description section. The FMPM states "*A Contingency Plan is an interim forest management plan that is required when special circumstances affect the implementation of a forest management plan*". The 2010-12 CP does not contain a forest management unit description section.

Questions emerge from this amalgamation that deserve further consideration. For example, since all of the forests had data that met the Forest Information Manual (FIM) requirements, why did it take such a lengthy period of time to develop the planning inventory? Are there problems with FIM or were there inadequate resources to bring the inventory together? Why does the MOE and MNR not consider a forest description for a new forest to be important in a Contingency Plan? Are there redundancies in the planning manual describing the required content of a management plan?

Discussion:
A new forest created through amalgamation should have an interim forest management plan that actually describes the new forest. Although the current condition section of the CP and supporting documentation describe many important elements of the Forest, this is a function of some redundancies in the FMPMs (1996-2004) and does not explain why an important context setting section of the CP was not seen as being necessary by those proposing and approving the Contingency Plan proposal.

The plan under development for 2012 is already considering a Contingency Plan requirement for its first year of operation. No doubt the plan will have the required forest management unit description section. But these irregularities arising from a complex amalgamation of several forests creates problems that will be encountered on a grand scale if the proposed tenure and pricing reforms lead to large amalgamations across the Province. In addition to planning issues, amalgamations have other issues such as how LCCs are formed, how roles are distributed among District offices and how "trends analyses" are interpreted.

In addition, the reasons for a Contingency Plan, such as the delays in planning inventory approval, deserve review. Assuming all forests met FIM criteria, the audit team questions why there were problems in combing data sets. These questions merit attention by Corporate MNR to ensure the planning support system is functioning properly.

Conclusion:
The unusual circumstances surrounding the 2010-12 CP deserves further review and a report on lessons learned to better inform future amalgamations.

Recommendation 5: Corporate MNR, in consultation with the Ministry of Environment, must investigate and report upon lessons learned in the amalgamation and associated planning challenges encountered in the creation of the Abitibi River Forest to ensure information management systems and other procedures are adequate to deal with future amalgamations.

Independent Forest Audit – Record of Finding

Recommendation 6

Principle: 3. Forest Management Planning

Criterion: 3.4.1.4 FMP achievement of the Checkpoint *Support for Proposed Management Strategy*

Procedure: 1. Assess progress towards achievement of the checkpoint by reviewing the results of the desired forest and benefits process

Background Information and Summary of Evidence: The Abitibi River Forest is an example of a forest operating at a scale more consistent with the Forest Management Guide for Boreal Landscapes. Such a scale should allow for better solutions to landscape-level issues. However, the reporting of various forest cover indicators at this large scale may come at the expense of localized issues such as representation of certain forest cover types within some management sub-unit locations.

Discussion:
Other models like Patchworks allow these trade-offs to be more transparent at different scales of resolution compared to SFMM. Patchworks was used to help explore these trade-offs during the development of the Forest Management Guide for Boreal Landscapes. This guide is soon to be released and will be used in the development of 2012 forest management plans

Conclusion:
Given the pressure on wood supply and non timber values, the preparation of forest management plans on amalgamated forests would benefit from a more careful analysis of trade-offs at different scales using additional decision support tools such as Patchworks.

Recommendation 6: Corporate MNR must consider requiring that trade-off analysis be conducted using an appropriate decision support tool on amalgamated forests.

Independent Forest Audit – Record of Finding

Best Practice 1

Principle: 3. Forest Management Planning

Criterion: 3.4 Proposed Long-Term Management Direction

Procedure: Assess achievement of the checkpoint for portions of the FMP relevant to habitat classifications

Background Information and Summary of Evidence: The 2010-12 CP provides considerable discussion about woodland caribou. The LTMD with respect to caribou is comprehensive and is supported by Supp Doc 4. Caribou Strategy (Forest Dwelling Woodland Caribou Protection In the Cochrane Area Forest). The LTMD focuses on caribou in four sections: 3.2.3.6 Historic Caribou Habitat; 3.2.3.7 Caribou Habitat Description; 3.2.3.9 Spatial Caribou Habitat; and, 3.2.3.10 Marten, Caribou and Marten/Caribou Core Areas.

The primary data source for spatial decisions related to caribou was the ongoing multi-partner research initiative established to study woodland caribou habitat and range use. The study was initiated in 1998 and involves collaring caribou cows with GPS radio-collars that track animal movement which, when plotted with habitat, roads or other landscape features, help to gain understanding of caribou response to management decisions and strategies.

Discussion:
The caribou study has contributed significantly to knowledge of caribou movement and range use in the area. Knowledge gained from this study has contributed to FMPs including 2010-12 CP. The intent is to collar another 30 caribou bringing the number to 50 and to collar more wolves to bring the number to 36 in six to eight packs. Additional wolf tracking data will lead to better understanding of the interactions between caribou and wolves.

Conclusion:
The knowledge base provided by this study is invaluable for integrating caribou habitat and range needs with forest management planning.

Best Practice 1: The ongoing multi-partner woodland caribou study is an excellent example of applied research that has provided and continues to provide significant science-based contributions to forest management planning.

Independent Forest Audit – Record of Finding

Recommendation 7

Principle: 3. Forest Management Planning

Criterion: 3.5.5 FMP harvest and natural depletions

Procedure: Review the applicable FMPM requirements related to planned clearcuts, including planned clearcuts that exceed 260 ha, and assess whether

- there is appropriate silvicultural or biological rationale for planned clearcuts that exceed 260 ha

Background Information and Summary of Evidence:
A listing of planned clear cuts >260ha and specific biological or silvicultural rationale for these larger planned cuts is to be provided in Table FMP-16. In the 2010-12 CP in many cases there is no rationale for the planned cuts and often the text has been truncated (possibly a result of formatting into pdf). For example, the following rationale is provided for Block 300 (note the truncated final sentence): "*The planned harvest block is located in the Marceau area of the TBS sub-unit. The block is composed of mostly lowland black spruce areas and includes a large amount of forecast depletion area which will not be cut before April 1, 2010. Both the NDPEG in*".

Discussion:
The 2009 FMPM still requires biological or silvicultural rationale be provided for planned cuts >260ha.

Conclusion:
The following recommendation is made to ensure the next plan meets the requirements.

Recommendation 7: ARFMI must ensure that the next FMP contains biological or silvicultural rationale for planned clear cuts greater than 260 ha.

Independent Forest Audit – Record of Finding

Recommendation 8

Principle: 3. Forest Management Planning

Criterion: 3.5.1 FMP areas selected for operations

Procedure: 3.5.1.1 Review areas selected for operations and assess whether

- the FMP selects areas for harvest, consistent with the AHA by forest unit and the selection criteria

Background Information and Summary of Evidence:
Planned harvest in the 2010-12 CP for the Abitibi River Forest closely mirrors the projected/forecast harvest area - about 38,000 ha is planned for harvest over the two-year term. About 9,000 ha of the allocation (~24%) is in younger aged stands than modelled. This is considered a significant level of age class substitution.

The age class substitution is rationalized in the CP as necessary due to re-allocating stands not harvested in the previous plans (mainly the 2005-10 Iroquois Falls FMP), focusing allocations away from contentious areas (including all stands in the caribou zone) and for operational and access considerations. The substitution is further rationalized – "*the younger for older age class substitutions for the planned harvest area are not expected to impact the long term sustainability as future harvesting during the 2010-20 term will be expected to move to these older areas as much as possible*".

Largely due to the age class substitution, the selected allocation is predicted to provide considerably more volume than modelled. The volume for the two years should be about 2.6M m3 conifer and 1.0M m3 hardwood but planned harvest is 3.7M m3 conifer and 1.3M m3 hardwood - an extra 1.1M m3 of conifer (+30%) and 300k m3 of hardwood (+24%) over the two years. Reasoning given is limitations to operating areas to avoid caribou habitat, to utilize accessible areas and to avoid contentious areas. Also, "*With the allocations being kept out of the lower productivity areas of caribou habitat in the more northerly sections of the unit, this meant that allocations were forced to the more productive areas of the forest*".

Discussion:
As described in the 2010-12 CP this imbalance could be re-aligned over the remaining eight years of the planned 2010-20 FMP but according to interviews with MNR staff and documentation, the plan for the Abitibi River Forest has changed. Instead of completing a plan for the term 2010-20, which was to include the planned harvest in the 2010-12 CP as the first two years of the ten year allocation, the new plan is to produce a 2012-22 FMP. This will not allow re-alignment of the allocation and may provide for additional age class substitution into younger stands. Further, there will be no practical way of determining the effect of the imbalance during the two-year stand-alone CP.

Conclusion:
Due to the severe downturn in the forestry sector it is unlikely that the full planned harvest will be realized, so there are no real concerns regarding sustainability and no need to amend the 2010-12 CP. However, there is concern regarding public disclosure and accountability as well as further age class substitution should the new FMP be fully detached from the 2010-12 CP.

Recommendation 8: ARFMI must consider the harvest profile selected in the 2010-12 CP when developing the profile for the next FMP so that further substitution into younger age classes does not occur.

Independent Forest Audit – Record of Finding

Recommendation 9

Principle: 3. Forest Management Planning

Criterion: 3.5.5 FMP harvest and natural depletions

Procedure: 3.5.5.1 Assess planned implementation of the management strategy by reviewing

- the projected, forecast and planned harvest (including fuelwood) and natural depletions in relation to the applicable FMP planning requirements including residual stand structure and comparison to the management strategy

Background Information and Summary of Evidence:
The 2010-12 CP contains an excellent section describing utilization direction to be used during operations. The direction was adapted from the Northeast Region Operations Guide for Marketability Issues (Apr. 2008). The Operations Guide was developed over several years by an MNR Regional group aided by several scientific advisors and industry representatives as a result of ongoing and forecast utilization issues in the Region. The Guide was developed mainly to provide direction regarding natural renewal of hardwoods following partial harvest but also provides direction for renewal to conifer.

The Northeast Guide allows for the retention of up to 30% of standing trees in cutovers (equated to approximately 70 trees per hectare). This value was selected based on provision of adequate openings for natural renewal of hardwood tree species. The Guide also allows for felling and leaving up to 100 trees per hectare reasonably distributed on site and bringing an unidentified number of additional unmarketable trees to roadside to reduce renewal interference and provide possible future fibre for emerging markets. When renewing conifer, no more than 25-50 residual trees are to be left standing per hectare after harvest. Specific renewal stocking limits are also provided:

- Site occupancy cannot be reduced to less than 90%
- Density of well-spaced, free-growing trees cannot be reduced below 1,000 conifer stems per hectare or 1,500 hardwood stems per hectare (further identified as effective density of >7,000 randomly distributed aspen stems per hectare).

The Guide also includes a requirement to develop a prescription/action plan to ensure silvicultural success and adherence to accepted practices in stands harvested using the Guide. Appendices also include deferral strategies as well as a sample operational decision key.

Discussion:
The Northeast Guide is considered a thoughtful resource for use by forest management planners but based on auditor experiences in the forest sector (no operations occurred during the audit term so field review was not possible) there are potential issues. First, Ontario's FRI Photo Interpretation Specifications and the Forest Information Manual (2009) Technical Specifications for FRI note that stands with low stocking (traditionally deemed 'barren and scattered') have a crown closure of less than 25%. Therefore a 30% residual canopy following harvest will still form a stand in the next FRI regardless of silviculture performed and the stand will be classified as a low-stocked, high-graded stand. Second, there is no formal requirement to complete pre-harvest ground verification of forested conditions (one tactical consideration in the Guide is to "*consider field verification*"). The current inventory is often not precise enough to determine the required volume split, ground data or additional information is needed. In addition, the allowance for bringing unmarketable trees to roadside should be clarified. Loss of productive area along roadways to unmarketable trees should be minimized.

Conclusion:
The Northeast Guide residual canopy allowance should be aligned with FIM and Ontario's FRI Photo Interpretation Specifications to ensure consistency. Regarding the need for ground data or additional information – the utilization standards have fairly specific criteria that may not be met with the current inventory, which is based on interpretation of 1:20,000 scale black and white imagery. The auditors believe that ground surveying and/or utilization of the newer digital imagery for the Province would provide the additional information required to make informed management decisions for selected stands/blocks. Waste wood fibre (slash) management has been a concern of this audit and previous audits for this Forest. To ensure minimization of loss of productive land through bringing unmarketable trees to roadside, the Northeast Guide should clarify the expectations of this practice (e.g. only done within economic radius of end use facility, material piled and burned if not used within two years, etc.).

The following recommendation is made to strengthen the Guide in these respects.

Recommendation 9: MNR Region must update the *Northeast Region Operations Guide for Marketability Issues* document as follows:

- reduce the allowance for residual standing trees to no more than 25% canopy closure to better align the Guide with inventory standards
- incorporate a requirement to provide information, in addition to the current FRI description, to confirm actual stand conditions prior to finalizing operational plans
- clarify the allowance for bringing unmarketable trees to roadside in order to minimize the loss of productive area along roadways

Independent Forest Audit – Record of Finding

Recommendation 10

Principle: 3. Forest Management Planning

Criterion: 3.5.5 FMP harvest and natural depletions

Procedure: 3.5.5.1 Assess planned implementation of the management strategy by reviewing

- the projected, forecast and planned harvest (including fuelwood) and natural depletions in relation to the applicable FMP planning requirements including residual stand structure and comparison to the management strategy

Background Information and Summary of Evidence:
The Northeast Region Operations Guide for Marketability Issues was modified for use in the 2010-12 CP. In particular, allowance was provided to leave up to 70 residual standing trees on all sites. The 2010-12 CP pg. 180 states: "***Artificial Regeneration*** *- The following conditions apply to intolerant hardwood forest types where artificial regeneration for the establishment of conifer is proposed:*

- ***Trees Left Standing in the Cutover:*** *After the final harvest, no more than 70 trees per hectare are to be left standing as residual or wildlife trees or the site should be chemical site prepared."*

Discussion:
The Guide direction is to leave no more than 25-50 residual standing trees when conifer is planned so that proper silviculture treatment may occur.

Conclusion:
Allowing up to 70 trees is a considerable departure from the Guide direction, in particular without supporting rationale being provided for this in the FMP. Considering the Guide is the local resource used to aid in keeping utilization standards compliant with the Scaling Manual, the Guide direction should have been closely adhered to.

Recommendation 10: ARFMI must amend the utilization standards in the 2010-12 CP to be consistent with the Northeast Region Operations Guide for Marketability Issues document or provide compelling rationale for the significant deviation from that direction document. The 2012 FMP utilization standards should also conform to the Guide direction or provide rationale for departure.

Independent Forest Audit – Record of Finding

Recommendation 11

Principle: 3. Forest Management Planning

Criterion: 3.5.12 Determination of Sustainability

Procedure: Assess whether the FMP provides for the sustainability of the Crown forest on the management unit based on the collective achievement of the objectives, comparison of proposed operations to the LTMD and the associated rationale for any management objectives that are not achieving the desired levels.

Background Information and Summary of Evidence:
Section 3.7.7 of the analysis package for the 2010-12 CP includes specifics regarding planned conversion of harvested area to non-forest area based on an analysis by Tembec. The associated strategy links slash management to renewal intensity.

The slash analysis used for developing the corresponding 2010-12 CP model input included mapping of slash cover and calculating land lost by treatment type. No conversion was modelled after 30 years as all roads were assumed to be in place and slash disposal methods (e.g. biomass utilization) were expected to reduce slash losses to 0%.

Discussion:
Considering minimal on-the-ground improvement has occurred in slash management over the past 30 years and much of the Forest is very remote, the audit team believes the model assumption of no slash losses after 30 years is overly optimistic.

Conclusion:
Modelling for forest management plans needs to reflect on-the-ground results as closely as possible. In the absence of firm Provincial policy and considering the remoteness of much of the Forest, modelling for zero loss of productive land to slash after 30 years is not realistic. This should be remedied in the next FMP.

Recommendation 11: The Abitibi River Forest planning team must consider on-the-ground results, current Provincial direction and the remote nature of a large portion of the Forest when modelling for productive land loss due to waste wood fibre in the 2012-22 FMP.

Independent Forest Audit – Record of Finding

Recommendation 12

Principle: 3. Forest Management Planning

Criterion: 3.5.12 Determination of Sustainability

Procedure: Assess whether the FMP provides for the sustainability of the Crown forest on the management unit based on the collective achievement of the objectives, comparison of proposed operations to the LTMD and the associated rationale for any management objectives that are not achieving the desired levels.

Background Information and Summary of Evidence:
Section 3.7.7 of the analysis package for the 2010-12 CP includes specifics regarding planned conversion of harvested area to non-forest area based on an analysis by Tembec. The associated strategy links slash management to renewal intensity.

Using the CP allocated harvest area and the plan's estimates of slash coverage by silvicultural intensity, the audit team calculated that about 470 ha of productive land would be lost annually under slash (4,700 ha of productive Crown land lost or severely delayed for regeneration over the ten year term of an FMP). To the audit team this represents a significant potential loss of productive forest land. However, the issue is not confined to the Abitibi River Forest.

Discussion:
Accumulating waste fibre along roadways following harvesting operations is directly associated with mechanized full tree to road-side logging operations. With this process most unmerchantable material (i.e. slash) is laid down in long corridors next to the roadbed, often on both sides. Depending on tree size, marketability factors, etc. a considerable amount of waste fibre can accumulate along roadbeds. Accumulated waste wood fibre, particularly from conifer trees, is known to break down very slowly and create a physical impediment to new tree growth and chemically alter soil so that few plant species can grow under and around the slash.

To illustrate the duration and extent of the issue Provincially, the audit team conducted an analysis of IFA recommendations related to slash management. The analysis, covering the 1996-2008 period, found that recommendations were made in every year (average 5.5/year) and that the vast majority of recommendations (69) were directed at the Management Unit/District level while only three were directed at the Provincial (e.g. policy) level. Thirty seven of the recommendations were made in the Northeast Region, 33 in the Northwest Region and two in the Southern Region. While action plans have been developed to address IFA recommendations these have not always translated into reduced slash on the ground.

It is the audit team's opinion that the root of this ongoing problem of ineffective slash management is the lack of a clear Government policy requiring waste fibre management on Crown lands in Ontario. Other jurisdictions such as Manitoba have mandated that all waste fibre be left within the harvest area away from roadside. The most recent Provincial level recommendation related to slash occurred in the 2002-07 IFA for the Romeo Malette Forest. A component of the action plan to address the recommendation looked to the Stand and Site Guide, under development at the time, to provide direction.

In the audit team's view, the Stand and Site Guide, now released, does not adequately address the loss of productive forest land to slash because the guideline definition allows for unrestricted local variation of application, and the actual guideline, which uses the ambiguous wording (see underlined text) '*Unutilized woody material ... will be piled, redistributed, or otherwise treated to increase area available for regeneration*', allows too much flexibility in managing slash and thus allowance to continue with current practices, which are not dealing with the issue of significant, long term losses of productive forest area. As an example, leaving slash unpiled at roadside in anticipation of eventual natural recycling could be construed as an acceptable 'treatment to increase' available area.

To verify the predicted inadequacy of the Stand and Site Guide in dealing with slash, the auditor spoke with one of Tembec's forest management planning staff currently working on completing a new FMP, which must heed the Stand and Site Guide (SSG), for another management unit in Northeastern Ontario. This representative noted that Tembec's standard slash management policy has been included in the draft FMP and is expected to meet the SSG requirements. It is the auditor's opinion that Tembec's slash management policy allows for leaving large areas of slash untreated and has been ineffective in minimizing productive land loss and therefore does not meet the intent of the SSG direction.

Conclusion:
When preliminary audit findings were discussed during the closing meeting held at the end of the field segment of the audit, the sentiment from company representatives was that current slash management practices will not considerably change until clear Provincial direction to do so is provided; the auditors concur. The history of poor slash management in Ontario continues, as illustrated by current practices on the Abitibi River Forest. Despite repeat findings and recommendations in the Independent Forest Audits, the Province has failed to develop effective policies and guidelines that lead to appropriate practices on the ground to address the loss of productive forest land to slash. The auditors forecast that direction in the Stand and Site Guide will not substantially change this.

Recommendation 12: Corporate MNR must develop a policy to address waste fibre management, consistent with the intent of minimizing losses of productive forest land, and provide associated direction to MNR regions, districts and the forest industry, including standards for acceptable allowances for conversion of productive forest land to non-productive forest land. MNR should also periodically report to the public the cumulative loss of area and growing stock potential due to forest land occupied by waste fibre.

Independent Forest Audit – Record of Finding

Recommendation 13

Principle: 3. Forest Management Planning

Criterion: 3.5.12 Determination of Sustainability

Procedure: Assess whether the FMP provides for the sustainability of the Crown forest on the management unit based on the collective achievement of the objectives, comparison of proposed operations to the LTMD and the associated rationale for any management objectives that are not achieving the desired levels.

Background Information and Summary of Evidence:
There is no direction in the 2010-12 CP regarding management of chipping debris.

Discussion:
According to company representatives there is a plan to increase in-bush chipping on the Abitibi River Forest in the near future.

Conclusion:
While in-bush chipping can reduce slash accumulation, chipper debris can become a localized issue and an impediment to objective achievement. The auditors have found that excessive chipper debris has been an issue on other management units in Ontario and that lack of clear direction is often a root cause.

Recommendation 13: ARFMI must include direction regarding management of chipping debris in the next FMP.

Independent Forest Audit – Record of Finding

Recommendation 14

Principle: 3. Forest Management Planning

Criterion: 3.5.7 FMP renewal, tending, protection and renewal support

Procedure: 1. Assess planned implementation of the management strategy by assessing whether the:

- renewal, tending and protection operations have been planned as required of the applicable FMPM, including any proposed prescribed burns, aerial herbicide tending, eligible pest management areas, aerial application of insecticides
- forecasts are consistent with the proposed management strategy (e.g. the levels required to achieve management objectives) and whether any differences are material

Background Information and Summary of Evidence:
The proposed management strategy selected for the 2010-12 CP forecast a planned renewal intensity ratio of 61% Extensive, 35.5% Basic and 3.5% Intensive. Table FMP-21 shows a renewal program of 77% Extensive, 16% Basic and 7% Intensive. This is a significant deviation in planned renewal intensities vs. the management strategy (i.e. much more Extensive and a little more Intensive and much less Basic). Renewal operations for the 10 year forecast (2010-20) in FMP-21 were determined to be consistent with the LTMD, however they have little relevance since they will not be carried forward in the 2012-22 FMP.

Renewal, tending and protection operations forecast for the 2010-12 CP were based on areas harvested in 2008-09 and areas planned in the AWS for harvesting 2009-10. Renewal, tending and protection operations forecast for the 2010-12 CP were not based on SFMM modelling outputs, instead they were determined by each individual SFL holder and MNR staff (CMRMU) based on their own knowledge of the harvest areas. It was determined that the 2010-12 CP provided inadequate analysis and supporting information to justify the planned deviation from the LTMD during that two year period.

Block listings of the planned renewal activities on the SRFF, CMRMU & IFF were reviewed and it was found that there is insufficient information and analysis to substantiate the renewal activities planned in FMP-21 (2 year contingency period), particularly when compared to the renewal modelled.

The 2008-10 CP for the CMRMU also had a planned renewal profile which deviated significantly from the LTMD by relying more heavily on extensive operations (95% extensive (FMP-21) vs 66% extensive (LTMD)). According to company staff this was due to uncertainties in achieving planned harvest and having to order trees up to one and one-half years in advance of planting. Rationale in the text included noting that renewal discrepancies will be made up in the next plan - pg 191 ln 22-30 "*Because of the current economic uncertainty, the silvicultural program over the two-year period will be reduced....It is expected that a larger than normal regeneration program could be implemented the first year of the 2010-2020 FMP*"; this turned out to be the 2010-12 CP for the amalgamated forests. As noted, the 2010-12 CP also deviated so this was not reconciled as planned.

Interviews and documentation indicate that a 2010-20 FMP (for which the 2010-12 CP was to be the first two years) is no longer being considered; instead a 2012-22 FMP is to be implemented.

Section 4.8.3 in the CP (comparison of proposed operations to the LTMD) provides an erroneous analysis of the proposed renewal operations (2010-2012) vs. the LTMD stating that "*more planting over natural regeneration is planned*". However, planned planting area shown in Table 38 does not correspond with planned planting in Table FMP-21 (21,087 ha vs. 4,252 ha). The Table 38 planned planting value was determined to be an error as was the statement that more planting is planned over natural regeneration. The planned amount of planting is 4,252 ha (FMP-21), ~10,000 ha short of the planting levels required to meet the proposed management strategy.

Part B, Section 4.8 of the 2004 FMPM states, in part, "*If proposed types and levels of operations deviate from the projections in the LTMD, a discussion of the effects on objective achievement and sustainability will be provided.*"

Because the large planting discrepancy was not recognized during plan preparation, no discussion or analysis was provided in the CP which substantiates the significant deviation from the modelled renewal program

Discussion:
It is important that planned renewal activities are consistent with the management direction in the FMP or that sufficient analysis and rationalization is provided in the plan to substantiate significant deviations. If a 2010-20 FMP was developed and planned renewal was consistent with the 10 year forecast in FMP-21 of the 2010-12 CP there would be no issue. However, if a new 2012-22 FMP is developed, there will be little linkage to the prior contingency plans and reconciliation of deviations between planned and modelled renewal may not occur.

The requested analysis, rationalisation and reconciliation of the planned renewal operations during the 2010-12 period will be tabled in the 2012-22 FMP since the current CP will expire in 2012 and any requested amendments to the plan would likely not receive approval until after plan expiry.

Conclusion:
The deviation between modelled and planned renewal in the 2008-10 CP for the CMRMU and the 2010-12 CP for the amalgamated forests, which select more extensive treatments than modelled, does not meet FMPM requirements - 2004 FMPM (A-53 ln 4-6) states "*The levels of renewal and tending operations will be consistent with the projected levels of the proposed management strategy and the results of the renewal and tending analysis*". Similar direction is included in the 2009 FMPM so a recommendation is made.

Recommendation 14: ARFMI must consider the renewal profile selected in the 2010-12 CP when developing the profile for the next FMP and include sufficient analysis in the 2012-22 FMP to justify the significant deviation from the planned LTMD during the two year contingency period.

Independent Forest Audit – Record of Finding

Recommendation 15

Principle: 3 Forest Management Planning

Criterion: 3.5.10.2 FMP monitoring programs

Procedure: Assess whether the monitoring programs to be implemented, including forecast level of assessment, are sufficient to assess the compliance and program effectiveness on the management unit.

Background Information and Summary of Evidence:
Table FMP-1 of the 2010-12 CP indicates 172,583 ha of Managed Crown Production Forest are below regeneration standards (about 9% of the Production Forest). Assuming harvest and renewal rates were relatively equal over the past several years this equates to about 17,000 ha that require regeneration surveying annually.

Table FMP-25 indicates 22,189 ha is to be surveyed over the 2010-12 period (about 11,000 ha yearly). This is approximately 6,000 ha short of the expected annual level of survey needed to at least maintain the proportion of area deemed below regeneration standards.

Discussion:
The forecast deficit of renewal assessment will lead to an increase of area classified as below regeneration standards. Additionally, underachievement in areas surveyed leads to delays in assessing silviculture success.

Conclusion:
Timely assessment of renewing land is needed to ensure the FRI is kept current and to determine if renewal efforts on the landbase are consistent with the LTMD. Increasing area classified as below regeneration standards contributes to uncertainties in the FRI and FMP modelling.

The 2004 FMPM (B-99 ln 8-10) states "*The amount of area to be assessed for success should be consistent with the level of regeneration success required to meet plan objectives and the management strategy as well as levels of past disturbance (i.e., harvest and natural).*" This direction needs to be followed.

Recommendation 15: ARFMI must review the planned renewal assessment program in the 2010-12 CP to ensure that the next FMP covers the existing shortfall.

Independent Forest Audit – Record of Finding

Recommendation 16

Principle: 4. Plan Assessment and Implementation

Criterion: 4.3 Harvest

Procedure: Review and assess in the field the implementation of approved harvest operations. Include the following:

- assess whether: the harvest and logging methods implemented were consistent with the FOP; the FOP was consistent with the SGRs; the FOP was certified by an R.P.F. or other qualified individual, and actual operations were appropriate and effective for the actual site conditions encountered

Background Information and Summary of Evidence:
There has been a relatively long history of waste fibre (i.e. slash) management issues in the area. The 2000-2005 IFA for the SRFF recommended that Tembec ensure slash management through piling, piling and burning, or slash distribution be carried out wherever logging slash is accumulated.

The audit action plan for the slash recommendation contained four action items that included developing a slash management strategy and establishing and monitoring slash management targets. The status of three of the four items was deemed completed by Tembec, with one deemed started but not completed.

The item deemed not completed related to development of a slash management strategy. Tembec developed a draft slash strategy, which was submitted in June 2008 as Amendment #9 to the 2005-10 FMP. MNR rejected the amendment due to:

- concerns regarding the effectiveness of the methods proposed,
- lack of a cost benefit analysis,
- the need to identify how and where the intensity zones would be applied,
- modeling concerns and
- backlog slash.

The draft strategy was reviewed during this audit and judged to be significantly deficient in meeting the slash management recommendation made in the 2005 IFA. The strategy would have allowed for leaving slash unmanaged at almost all planned harvest sites save some near the Highway 11 road corridor.

MNR requested a meeting with Tembec to discuss concerns with the draft strategy. According to the Audit Action Plan Status Report, due to a lack of harvest activity on the Forest, the meeting with MNR had low priority and did not take place. Instead, focus was placed on developing a slash management strategy for the 2010-12 CFMP for the amalgamated Abitibi River Forest.

As discussed in the Forest Management Planning section of this audit report, the slash management plan in the 2010-12 CFMP allows for significant conversion of forested land to non-forest due to slash accumulation. When compared, the 2010-12 CFMP slash plan is not far removed from the draft strategy for the Smooth Rock Falls Forest, which was rejected by MNR. One MNR staff member noted that the 2010-12 CFMP slash plan was approved because the amalgamation included three MNR districts; thus neither had full control of the approval.

Discussion:
While there are many options for reducing slash at roadside, piling and burning had been the preferred choice to regain maximum productive area. However, negative public comments regarding smoke, difficulty getting MNR approval to burn (in some jurisdictions), saturated conditions during planned ignition and high costs relative to net area recovered became impediments to slash piling and burning. Also, locally, the predominance of winter harvest and need to haul wood before spring thaw means slash management is a low company priority. In the absence of clear Provincial direction, less intensive options such as piling with no burning or leaving slash un-piled gained favour.

The 2005-10 FMP included limited information regarding the planned slash management program - "*redistribution of slash was to be explored*" (this was not done), otherwise "*priority was to be given to higher productivity sites and* *not all sites were to be piled or burned"*. So, there was no commitment to manage slash on a majority of planned harvest sites (i.e. the lower productivity lowland spruce sites that dominate the area).

With the severe downturn of the forest sector over the past several years slash management visibly declined on the Smooth Rock Falls Forest. Management in areas operated during this audit term consisted of piling slash or leaving it un-piled in more remote, winter harvest areas. In some areas harvested close to the Highway 11 corridor slash was chipped and removed for use as hog fuel.

Conclusion:
Continual improvement is touted as an over-arching objective by the forest sector, so slash management should have improved through time rather than regressed. In the absence of Provincial direction (discussed with a recommendation in the Forest Management Planning section of the audit), forest managers have opted for cost cutting measures that do not allow for adequate management of waste fibre at many sites.

Although FMP direction was generally followed during the audit term, the slash management program delivered was not considered effective by the audit team and did not fulfill prior IFA recommendations and related action plans related to reducing slash on the Forest. Further, the audit team considers the slash management plan in the 2010-12 CP inadequate to minimize loss of productive Crown land and believes that it will not meet the intent of the related guidelines in the Stand and Site Guide.

Recommendation 16: ARFMI must ensure the slash management plan in the 2012-22 FMP can meet plan objectives and guidelines focused on minimizing loss of productive land. ARFMI should also deal with treatable backlog areas of slash.

Independent Forest Audit – Record of Finding

Recommendation 17

Principle: 4 Plan Assessment and Implementation

Criterion: 4.1 Plan Assessment – To review and assess through field examination whether information used in preparation of the FMP was appropriate and assess the implementation of the management strategy.

Procedure: 1. In the conduct of the field audit examine areas of the FMP that can be assessed in the field and assess whether the FMP was appropriate in the circumstances. Include consideration of:

- modelling assumptions
- SGRs e.g. overall relevance to management unit as seen in the field (all being implemented as per management alternative/strategy or portion is planned reflective of field application).
- Proposed harvest, renewal and tending areas for consistency with eligibility and selection criteria.

Background Information and Summary of Evidence:
Careful Logging Around Advanced Growth (CLAAG) or Harvesting with Regeneration Protection (HARP), depending on the pre-harvest forest condition is a harvesting system used on lowland sites to protect advanced growth black spruce. CLAAG and HARP are well suited to most of the lowland sites that dominate the area. Effective CLAAG and HARP prescriptions were viewed during the field audit and it was evident that operators are well trained and very proficient at implementing careful logging techniques on lowland black spruce sites, which are abundant on the CMRMU. Areas harvested under the CLAAG and HARP systems were found to have sufficient advanced regeneration spruce in the leave strips while site impact within harvest corridors was minimized, thus providing the requisite microsite for natural seeding or potential fill planting.

However, operators have become over-reliant on this system and careful logging is implemented on virtually all sites. Careful logging techniques are not well suited to upland sites since the advanced regeneration in leave strips often consists of undesirable species. Careful logging viewed on most upland sites was deemed to be ineffective. Little advanced growth was present to protect in some areas and shrubs now dominate. In other areas regeneration mainly consists of balsam fir, balsam poplar and birch – less desirable species than the spruce and aspen harvested. Considerable active renewal through chemical and/or mechanical site preparation, planting and tending will be needed to meet standards on some of these sites. Other sites will naturally renew to less desirable species.

The retention of balsam fir, birch, larch, etc. through careful logging is contributing to a shift in forest units on the SRFF. Free to grow data collected during the term shows a significant increase in hardwood leading FUs (34%) LC1, SF1 & SP1 FUs (227%) while SB1 (black spruce rich) and SB3 (black spruce poor) FUs are decreasing (35%). The retention of un-marketable larch trees which are known to be prolific seeders is a primary contributor to the observed FU shift in SB1 & SB3 FUs.

Comparatively, FMP-16 (Projected Forest Unit Transition for The Available Harvest Area) from the 05-10 SRFF FMP only projects a 6% decrease in hardwood leading forest units and a 15% decrease in LC1, SP1 & SF1 FUs. SB1 & SB3 FUs have no projected shift in future forest units.

Issues relating to shifting FUs on the SRFF are further confirmed in the Trends Analysis Report; *'the movement to mixed spruce/fir/pine/poplar is largely attributed to the method of harvest. This trend will continue as long as the harvest method and subsequent silviculture maintains other species ... The practice of carefully logging around advanced conifer has led to the naturally regenerated stands moving towards a more mixedwood condition than the original stand'.* The continued application of careful logging on upland sites will lead to the increase of less desirable tree species on the SRFF over time.

The previous IFA (2000-2005) also determined that careful logging of upland sites was an issue. It was found that residual regeneration and trees on many of these sites was hampering the active renewal program through reducing suitable planting areas and providing tending challenges.

Pre-harvest inspections were completed during the fist three years of the term, however very few changes to FOP prescriptions and/or harvesting method were made subsequent to the assessment of pre-harvest stand conditions and advanced growth potential.

Upland careful logging harvest further hampers active renewal efforts by reducing available planting areas and presenting tending challenges; this was noted during the audit. On these sites planting densities were constrained due to lack of planting spots, a heavy shrub layer and presence of less desirable tree species. Average planting density throughout the term was 1,354 trees/ha compared to the targeted density of 1,800 trees/ha.

The *Silvicultural Guide to Managing for Black Spruce, Jack Pine and Aspen on Boreal Forest Ecosites in Ontario* (Silvicultural Guide) states that CLAAG can increase the proportion of balsam fir in the future stand and that the use of advanced growth may be used to enhance other regeneration treatments. The Silvicultural Guide also provides clear direction on the types of sites which natural advanced growth is recommended, conditionally recommended and not recommended (NR). Not recommended activities are described as being not ecologically appropriate or not supported by field experience and field knowledge. The use of not recommended activities requires the implementation of exceptions monitoring.

Discussion:
The 2010-12 CP SGRs no longer permit CLAAG or HARP on upland sites; however there is now a compliment of upland sites treated in this manner that will regenerate to poor quality stands unless remedial treatments are undertaken. Some of these sites will be too expensive to treat, however the effort should be made to identify and treat those that are practical to do so.

Also, should it be determined during the review of these sites that NR activities have been implemented, such as the use of natural advanced growth as a regeneration method on upland sites, that exceptions monitoring be implemented as per the requirements of the FMPM and the Silvicultural Guide.

Conclusion:
The past implementation of CLAAG harvesting patterns on upland sites is contributing to the retention of less desirable species, particularly larch and balsam fir, and, in the audit team's view, will lead to a degraded stand condition in terms of species composition and stocking.

Recommendation 17: ARFMI must:

e) conduct an immediate review of all upland sites harvested under the CLAAG system since 2005 and implement remedial silvicultural treatments, where practical, on sites found not likely to become a silvicultural success
a) implement exceptions monitoring on all upland Careful Logging Around Advanced Growth sites for which the use of natural advance growth (without planting) as a regeneration method is deemed as not recommended under the Silvicultural Guide.

Independent Forest Audit – Record of Finding

Recommendation 18

Principle: 4. Plan Assessment and Implementation

Criterion: 4.1 Plan Assessment – To review and assess through field examination whether information used in preparation of the FMP was appropriate and assess the implementation of the management strategy.

Procedure: 1. In the conduct of the field audit examine areas of the FMP that can be assessed in the field and assess whether the FMP was appropriate in the circumstances. Include consideration of:

- modelling assumptions
- SGRs e.g. overall relevance to management unit as seen in the field (all being implemented as per management alternative/strategy or portion is planned reflective of field application).
- proposed harvest, renewal and tending areas for consistency with eligibility and selection criteria.

Background Information and Summary of Evidence:
It was noted that, due to lack of markets, larch trees were often left standing on site following harvest as part of the NDPEG requirements. Larch is a prolific seeder and dense larch regeneration was found on many of the lowland stands audited. It was evident that larch is becoming more prevalent in some stands; this increase from one generation to the next is sometimes called 'creep'.

Furthermore, upland CLAAG harvesting patterns were broadly implemented on most harvested sites. Although the majority of areas harvested were well suited to this type of harvesting (lowland black spruce peatland) implementation on upland sites resulted in a significant retention of undesirable species.

Larch creep has some history on the Forest. Older stands viewed for FTG often had higher larch components than the original stand composition; this is being captured in monitoring and reporting for the Forest. The retention of balsam fir, birch, larch, etc. through careful logging is contributing to a shift in forest units on the SRFF. Free to grow data collected during the term shows a significant increase in hardwood leading FUs (34%) LC1, SF1 & SP1 FUs (227%) while SB1 (black spruce rich) and SB3 (black spruce poor) FUs are decreasing (35%). The retention of un-marketable larch trees which are known to be prolific seeders is a primary contributor to the observed FU shift in SB1 & SB3 FUs.

Comparatively, FMP-16 (Projected Forest Unit Transition for The Available Harvest Area) from the 05-10 SRFF FMP only projects a 6% decrease in hardwood leading forest units and a 15% decrease in LC1, SP1 & SF1 FUs. SB1 & SB3 FU have no projected shift in future forest units.

Issues relating to shifting FU on the SRFF are further confirmed in the Trends Analysis Report; *'the movement to mixed spruce/fir/pine/poplar is largely attributed to the method of harvest. This trend will continues as long as the harvest method and subsequent silviculture maintains other species ... The practice of carefully logging around advanced conifer has led to the naturally regenerated stands moving towards a more mixed wood condition than the original stand'.* The continued application of careful logging on upland sites will lead to the increase of less desirable tree species on the SRFF over time.

Pre-harvest inspections were completed during the fist three years of the term, however very few changes to FOP prescriptions and/or harvesting method were made subsequent to the assessment of pre-harvest stand conditions and advanced growth potential.

The previous IFA (2000-2005) also determined that careful logging of upland sites was an issue. It was found that residual regeneration and trees on many of these sites was hampering the active renewal program through reducing suitable planting areas and providing tending challenges.

Discussion:
The main issue is that transition of significant amounts of area from forest units dominated by preferred tree species to those with less preferred tree species, such as larch, is a threat to forest sustainability. There has historically been very little market for larch, balsam fir or balsam poplar and this may not change.

It is suggested that the following modifications to operational practices be implemented:

- Best management practices implemented during harvesting activities to minimize the retention of larch trees as 'snags'. Trees should be felled or stubbed and left on site to prevent seeding. This practice has been implemented in the Red Lake District to minimize birch seeding in the Caribou management zone.

- Proper assessment of stand site suitability and black spruce advanced growth potential is needed prior to harvest implementation. This will likely require the physical delineation of CLAAG harvest areas vs. areas requiring conventional clear cut harvesting. The implementation of GPS systems during harvest would also allow operators to easily differentiate appropriate harvest prescriptions.
- Site preparation using sheer blades can be used as a remediation tool on sites with significant advanced growth of undesirable species (particularly Bf).

Conclusion:
Forest unit transition trends are moving beyond the modelled limits of the FMP. It was determined that operational practices are a primary contributor to the retention and proliferation of less desirable tree species on the CMRMU. Modifications to current operational practices are needed to ensure that a sustainable volume of marketable tree species is maintained on the Forest.

Recommendation 18: ARFMI must address the increase in presence on the Forest of less desirable tree species such as larch and balsam fir.

Independent Forest Audit – Record of Finding

Recommendation 19

Principle: 4. Plan Assessment and Implementation

Criterion: Criteria 4.7 To review and assess through field examination whether information used in preparation of the FMP was appropriate and assess the implementation of the management strategy.

Procedure: 1. Review and assess in the field the implementation of approved access activities. Include the following

- select a representative sample of each type of access activity (road construction, various types of water crossings - winter, culverts, bridges, road maintenance, decommissioning) from primary, secondary/branch and tertiary/operational roads constructed during the five-year period of the audit; include category 14 and category 9 aggregate pits for new roads and existing roads
- an examination of aerial photographs, FOIP reports, annual report information, including maps, for these operations
- determine whether the operations implemented were consistent with
  - locations in the approved FMP, AWS, category 9 aggregate permit
  - conditions on construction including the approved water crossings structure, *Fisheries Act* review, and conditions on crossings of other AOCs
  - use management (maintenance, access control, any decommissioning provisions)
- assess whether roads have been constructed, maintained, and decommissioned to minimize environmental impacts and provide for public and operator safety
- assess whether the planned monitoring program for roads and water crossings was implemented as planned and whether it was effective in determining any environmental or public safety concerns

Background Information and Summary of Evidence: The Marceau Road was constructed under an amendment in 2007 as a branch road. The field audit included a fly-over of the Marceau Road.

The 20.9 km road is located in the north-eastern part of the Forest and was constructed in an area of poorly drained and wet organic soils with extensive flats of black spruce. Road construction techniques used for this road involved scooping out ditches and using this material to assist in developing a roadbed. These ditches are then essentially bottomless with soft peat forming the base. Additional material was transported from aggregate areas to further develop the road base. The resulting feature appeared as a significant barrier to summer movement by woodland caribou.

Consideration of a road in this area was controversial as the road was to pass through a roadless area. As well, access to the area could be achieved from the south using old roads for much of the way, thereby reducing the length of new road construction.

Although caribou use of the area was known through the caribou research study, Amendment #3 in the 2006-2007 AWS included no consideration of caribou in its Use Management Strategy.

No forest harvesting activities have taken place since construction of the road.

Discussion: The Marceau Road remains a significant linear feature in an area where caribou use has been recorded. Since no timber harvesting has taken place and since caribou use of the area has been recorded, it is necessary that a Use Management Strategy that considers caribou use of the area be developed. This development would be consistent with the 2010-12 CP which states, "All Primary or Branch roads (both surfaced and winter) within the designated caribou management zone of the CAF will consider caribou and have a strategy for use and rehabilitation/decommissioning."

Conclusion: A use Management Strategy for the Marceau road should be developed following direction provided in the 2009 FMPM. This road use management strategy must be informed by the *Endangered Species Act, 2007*.

Recommendation 19: ARFMI must develop and implement a Use Management Strategy for the Marceau Road following direction in the 2009 FMPM; the strategy must be informed by the *Endangered Species Act, 2007*.

Independent Forest Audit – Record of Finding

Recommendation 20

Principle: 5. System Support

Criterion: 5.2 Document and Record Quality Control

Procedure: Assess the organization's information management system processes:

- storing copies of all relevant documents in a central location for audit inspection

Background Information and Summary of Evidence: It is MNR's responsibility to manage the public consultation process for forest management plans and amendments, including preparation of public notices and maintenance of adequate records. The audit team found deficiencies in MNR's record keeping in this regard. According to billing information for Amendment #3 (minor) public notices were placed in three English papers, two French papers, and Wawatay News; however, records of the actual notices were available for only three of the six papers. As such, required notice content could not be fully verified.

For Amendment #8 (minor) a record of whether a public notice was issued as per FMPM requirement "A public notice will be issued at least 15 days prior to implementation of the minor amendment" could not be located. In addition, only the records of the notices sent to Aboriginal communities and organizations were found; records of notices of the amendment to other potentially interested groups and individuals could not be located.

Discussion: Complete records of the public consultation process must be maintained in order to demonstrate conformity to FMPM requirements.

Conclusion: MNR's record keeping for public consultation for amendments does not fully support the IFA process which places significant reliance on an organization's records to demonstrate conformity to requirements.

Recommendation 20: MNR must establish record keeping procedures that ensure maintenance of public notice records for all amendments.

Independent Forest Audit – Record of Finding

Recommendation 21

Principle: 6. Monitoring

Criterion: 6.3.2 Silviculture Standards and Assessment Program

Procedure: 2. Assess whether the SFL/management unit assessment program is sufficient and is being used to provide the required silviculture effectiveness monitoring information including whether it

- assesses overall effectiveness of treatments, including those that are exceptions to silvicultural guides i.e. documented program, survey methodology such as survival, stocking, free-to-grow surveys, records, use and evaluation of results e.g. appropriateness of treatment for actual site conditions
- determines the need for and the type of remedial action required if an area is not successfully regenerated (e.g. in-fill plant, tending)
- assesses reasons where eligible areas are not determined to be successfully regenerated and addresses these situations
- is appropriately used to update the FRI
- assesses progress towards achieving the management strategy

Background Information and Summary of Evidence:
Through careful document review and staff interviews it was determined that significant system and staffing shortfalls contributed to under-achievements in the timely declaration of areas planned for natural regeneration.

During the term, 16% (1,768 ha) of the planned area for natural regeneration was declared in the ARs. Declared naturally regenerated areas are consistent with planned levels (adjusted based on actualized harvest) however, naturally regenerated areas were only declared in 2005 (1,529 ha, 86%) and 2006 (239 ha, 14%). Company interviews indicated that the majority of the areas declared in 2005 would have been harvested in the previous term and that budgetary and staffing constraints led to the curtailment of post harvest surveys near the end of the term (no harvest in 2007-08). Based on a forecast of natural regeneration pro-rated to the actualized harvest level (2,287 ha) and the discounting of areas declared in 2005 (1,529 ha) there was a significant underachievement in areas declared naturally regenerated (10% of pro-rated planned). Post harvest survey under-achievement is highlighted in the TAR; '*Increased reliance on natural regeneration was forecasted for the 2005 FMP however there has not been enough survey work completed yet to confirm this estimate.*'

The 2009 FMPM states (pg E-10, ln 36-38): *"Areas planned for natural regeneration will normally be reported in the year in which the disturbance (harvest or natural) occurred. If salvage harvest is being considered in areas of natural disturbance, reporting of natural regeneration may be delayed by one or two years."*

Discussion:
The proper execution of a silviculture effectiveness monitoring program plays a critical role in identifying any shortcoming or required remedial actions with implemented renewal, tending and protection activities. Tembec has in place pre and post harvest inspection protocols which adequately address these assessment requirements. However, silvicultural effectiveness monitoring levels must be implement in correlation to the levels of implemented artificial and natural renewal area.

Staffing and budgetary cutbacks implemented by Tembec during the latter part of the audit period were the primary cause of identified shortcomings in their silvicultural effectiveness monitoring program. These cuts were implemented due to a severe reduction in demand for lumber and pulp and paper products. Silvicultural effectiveness monitoring duties are now the responsibility of ARFMI which contracts FRMG as the primary service provider.

It is the opinion of the audit team that FRMG has in place adequate system and staffing support to sufficiently execute a complete and comprehensive SEM program. A thorough assessment of FRMG's execution of their SEM model will be completed during the next IFA.

Conclusion:
Areas planned for natural regeneration need to be declared within the required timeframe as stated in the FMPM.

Recommendation 21: ARFMI must address the backlog of areas that require assessment of natural regeneration.

Independent Forest Audit – Record of Finding

Recommendation 22

Principle: 6. Monitoring

Criterion: 6.3.2 Silviculture Standards and Assessment Program

Procedure: 3. Assess the actual level of the overall monitoring program including whether

- it was in accordance with the FMP, including silviculture guide exceptions monitoring, and whether it was appropriate based on the field audit and other evidence gathered through analysis of related criteria
- the amount of area eligible for survey is consistent with past levels of harvest and whether all areas are being addressed

Background Information and Summary of Evidence:
Free to grow surveys were conducted on the Smooth Rock Falls Forest in 2005, 2006 and 2007. Tembec suspended the FTG monitoring program for the remainder of the term due to budgetary and staffing constraints. During the term 6,435 ha were surveyed for free growing status. Only 38% of the planned levels (17,080 ha) of assessment were achieved during the plan term.

Discussion:
The accomplishment of planned FTG targets plays an important part in determining if implemented renewal treatments are effectively achieving the planned management strategy and ensuring that the FRI is up to date and accurate. Considering the low level of silvicultural success (55%) for areas surveyed in 2005, 2006 and 2007 and the FU unit shifts discussed in monitoring section of the report a complete assessment of areas planned for FTG assessment in the FMP is needed.

Conclusion:
The FTG backlog on the Smooth Rock Falls Forest needs to be addressed to ensure a correct determination of renewal and silvicultural success.

Recommendation 22: ARFMI must address the current backlog of FTG surveys on the Smooth Rock Falls Forest.

Independent Forest Audit – Record of Finding

Best Practice 2

Principle: 6. Monitoring

Criterion: 6.3.2 Silviculture Standards and Assessment Program

Procedure: 2. Assess whether the SFL/management unit assessment program is sufficient and is being used to provide the required silviculture effectiveness monitoring information including whether it:

- assesses overall effectiveness of treatments, including those that are exceptions to silvicultural guides i.e. documented program, survey methodology such as survival, stocking, free-to-grow surveys, records, use and evaluation of results e.g. appropriateness of treatment for actual site conditions
- determines the need for and the type of remedial action required if an area is not successfully regenerated (e.g. in-fill plant, tending)
- assesses reasons where eligible areas are not determined to be successfully regenerated and addresses these situations
- is appropriately used to update the FRI
- assesses progress towards achieving the management strategy

Background Information and Summary of Evidence:
The Cochrane District MNR implemented a silvicultural effectiveness monitoring program in 2005 covering two SFL's (SRFF & IFF) and one Crown managed unit (CMRMU). The program was based on Provincial directives, which were used to develop core monitoring tasks and minimum sampling targets for the District. The primary focus of the program was the assessment of FTG submissions through both aerial surveys and intensive ground surveys using the Well Spaced Free Growing methodology. Discrepancies between company submissions and MNR audit results were thoroughly discussed and analyzed. MNR also analysed FTG results with regards to silviculture success and trends in forest unit transitions. In addition, MNR audited the effectiveness of specific silviculture activities such as tree planting, tending, slash piling/burning and aerial seeding.

The program was implemented in each year of the audit term starting with the 2005 field season. A report was completed the following year for each field season; thus four reports were reviewed for the audit (2010 field season report not available until 2011). SEM results were presented annually to the SFL holders and/or service providers to identify shortcomings in the silviculture program. When necessary, MNR and company staff jointly developed strategies and required action plans to address critical issues.

Discussion:
Silvicultural effectiveness monitoring is an integral part of a successful silviculture program. The Cochrane District MNR SEM program was successfully implemented during a period when most company monitoring programs were being suspended due to budgetary and staffing constraints. The Cochrane District MNR SEM program is providing valuable data and analysis concerning the success of implemented silvicultural activities. MNR staff is cooperatively working with company staff to meet information requirements.

Conclusion:
The Cochrane District MNR SEM program provides significant value with respect to monitoring, assessment and analysis of company FTG submissions and implemented silvicultural activities and identifying important silviculture trends. The maintenance of this program during challenging economic times and the cooperative working relationship with company staff set this program above the norm.

The audit team also determined that MNR completed outstanding work with regards to compliance monitoring (discussed in Monitoring section). This Best Practice was developed to recognize both of these areas of excellence.

Best Practice 2: The monitoring of silviculture effectiveness and compliance by the Ministry of Natural Resources during the audit term was deemed to be excellent.

Independent Forest Audit – Record of Finding

Recommendation 23

Principle: 6. Monitoring

Criterion: 6.2.1 SFL Holder Compliance Planning and Monitoring

Procedure: Determine whether the FOIP reports have been submitted electronically to the MNR database in accordance with requirements including timelines specified in MNR procedures and FIM.

Background Information and Summary of Evidence:
When operations were suspended during the audit term for a period greater than 20 working days, suspended operation reports were completed but the duration of a few suspensions and the content of suspension reports was found to be an issue.

According to FOIP, as of early October 2010 there are 13 suspended reports; based on April 1, 2008 Compliance Handbook direction, three reports over two years old are overdue:

- One report suspended since November 2005 notes that "*hardwood is to be hauled at some unknown future date in 2006*"; this has not yet occurred.
- October 2007 suspended report is related to Marceau Road – no reason for the suspension is given in the report nor is a date provided for completion of operations.
- October 2008 suspended report also deals with the Marceau Road. According to the report: "*the severe downturn in the forestry market prevented Tembec from continuing with planned harvest operations in the Marceau area and the costs of retrieving remaining roadwood was cost prohibitibive.*" No date for completion of operations is given.

Several other suspended reports lack required detail. For example, report #341674 simply notes that operations are suspended - reasoning for suspension and a timeline for completion of operations are not provided. More recent suspension reports include reasoning for suspension and a timeline to complete operations so no recommendation is made in this regard.

Discussion:
The most important issue with the 'extended' suspension reports is the significant delay of required silviculture treatments that may have occurred while awaiting completion of harvesting, hauling or other operations.

Some direction from ENF Policy 22.02.01 related to suspension reporting is: "*The suspended report will be assessed as In Compliance With Comments and must include a "task issue" which states the problem, identifies what work/operation is completed and yet to be completed, when the work/operation is expected to be completed and who will be responsible for its completion. Where a continuation of operations is outside the current approval period, MNR must ensure that the work to be done is included as a condition of the next year's approval (AWS). It is incumbent upon the licencee to apply to have the measurement-haul and processing date in the approval extended. Where the specified timeline for completion is not met, MNR will undertake a spot check inspection and compliance action will be taken as required.*"

Conclusion: As of April 1, 2010 suspension reports are no longer required; however, the overdue suspension reports discussed above need to be dealt with appropriately to determine the renewal status of these blocks and identify any required treatments.

Recommendation 23: MNR must conduct spot checks on the outstanding suspension reports and determine any compliance action to be taken.

Independent Forest Audit – Record of Finding

Recommendation 24

Principle: 6. Monitoring

Criterion: 6.5 Determine whether annual reports are prepared according to the FMPM and assess whether they accurately report implementation and assess progress in meeting objectives.

Procedures: 6.5.1 – 6.5.3; Review annual reports and compare against FMPM requirements and field observations.

Background Information and Summary of Evidence:
The Annual Reports met FMPM requirements. Table AR-14 (2004 FMPM) and AR-13 (2009 FMPM) report low (less than 55%) silvicultural success contrary to field observations.

Discussion:
The Silvicultural Ground Rules (SGRs as per Table FMP-5) and the Annual Report Tables (AR-13 (2009) and AR-14 (2004)) assume that only one future forest unit is associated with a given SGR. This ignores the fact that forest units may succeed over time and that many treatments are expected to lead to a certain proportion of future forest units depending upon the current condition, the desired future forest condition and the level of inputs or intensity of treatments.

The projections made in the strategic model (SFMM) recognize the reality of multiple post-harvest and post-fire successional pathways. These forecasts are the first step in adaptive management, followed by implementation and monitoring. Variances in monitored outcomes are used to alter practices and improve future forecasts as part of a continual cycle of institutional learning. Adaptive management is a key forest policy element in Ontario.

Conclusion:
The FMPM reporting system does not recognize multiple successional pathways, leading to a breakdown in the adaptive management cycle at the monitoring phase. In addition, low silviculture success ratios as currently derived by the reporting procedures under the FMPM, may send the wrong signals to policy makers and the general public.

Recommendation 24: Corporate MNR must review the reporting procedures and consider modifying them to recognize multiple successional pathways to improve the adaptive management process.

Independent Forest Audit – Record of Finding

Recommendation 25

Principle: 8.1 Contractual Obligations – SFLs

Criterion: 8.1.9 Audit action plan and status report

Procedures: 8.1.9.2 Audit Action Plan Status Report meets requirements

Background Information and Summary of Evidence:
The audit report for the previous IFA was received by the auditees in May 2006 which made the audit action plan due in July 2006. According to an MNR summary of activities related to the preparation of the Audit Action Plan and Status Report a Draft Action Plan (not viewed by auditor) was submitted by Cochrane District to FMB and Region on July 14, 2006. A revised Action Plan was subsequently submitted by Cochrane District on May 4, 2007 and final approval was given on June 13, 2007, approximately one year past due. The Action Plan met the content requirements of 2005 IFAPP. Based on the submission date of the Action Plan an Action Plan Status Report was required by July 13, 2009. A Year 1 Interim Status Report was submitted by Cochrane District on Nov 5, 2008 (the IFA had recommended MNR complete an Interim Status Report one year following approval of the Action Plan which would have been by June 2008). The Year 2 Status Report was submitted on September 7, 2010 whereas it should have been submitted no later than June 2009 based on IFAPP reporting timelines.

Conclusion:
The auditees failed to meet the timelines set in the IFAPP for submission of the audit action plan and status report and in the 2005 IFA report for submission of the interim action plan status report.

Recommendation 25: The Cochrane District Manager must ensure that submission timelines for IFA Action Plans and Status Reports are met.

Appendix 2 – Management Objectives Tables

2005-10 Forest Management Pan – Smooth Rock Falls Forest

Objective		Assessment - Auditor Comments
Conservation of Biological Diversity Objectives		
Biological Diversity	Ensure current biological diversity is not significantly changed. Where necessary and practical, restore.	Partially Met. FMP developed as required; however, progress toward pre-industrial forest condition could not be measured since the report on Pre-industrial forest condition was not done.
Habitat	Maintain preferred/marginal habitat for featured regional species within bounds of natural variation as portrayed in the results of the natural benchmark from the Strategic Management Model Analysis	Met. SFMM outputs developed accordingly. Strategies were implemented as described in the FMP.
Caribou Habitat	Increase knowledge and awareness of caribou on the Smooth Rock Forest	Met. Caribou collaring study was continued. Staff demonstrated good knowledge of caribou.
Marten Habitat	Provide marten core area on the Smooth Rock Forest	Met. Core area was 10.4% in 15 cores.
Nesting Habitat	Ensure that all know nesting sites for eagles, hawks, osprey and herons are protected	Partially Met. Specific AOCs were developed for nesting sites for osprey, herons and goshawks, owls and other raptors. One known bald eagle nest was not provided AOC protection as referenced in this objective.
High conservation values	Ensure that high conservation forest attributes (HCV) are identified and given due consideration for their protection on the forest	Met. FSC certification achieved for the combined Romeo Malette & Smooth Rock Falls Forests. HCV identification and protection are required for FSC certification.
Genetic Diversity	Ensure the genetic diversity of trees is conserved	Met. Seed volume targets met for Sb, Sw & Pj. Careful logging used extensively throughout the Forest. Group seed tree prescriptions also used on appropriate sites.
Forest Ecosystem Condition and Productivity Objectives		
Long-term Forest Health	Provide for the long-term health and vigour of Crown forests by using forest practices that, within the limits of silvicultural requirements, emulate natural disturbance patterns and landscape patterns.	Met. A range of harvest block sizes was developed and implemented; maintenance of residual stand structure followed Guide requirements
Slash Reduction	Develop and implement a slash management program for the Smooth Rock Falls forest.	Not met. Slash accumulation remains a significant problem.

Objective		Assessment - Auditor Comments
Forest Productivity	Keep forest ecosystems productive.	Partially met. 1,129 ha identified as NSR through field surveys; however SEM program was not maintained throughout the term. Only 45% (1,575 ha) of target NSR areas (3,500 ha) was treated during the term. A total of 20,018 ha are currently classified as being below regeneration standards of which 17,304 ha are class X lands (harvested since September 1995 and not yet FTG) and 2,714 ha are class Z lands (harvested before September 1995 and not yet FTG). Current NSR on the SRFF is significantly higher than the 3,500 ha target for this objective. Silvicultural liability which includes the treatment of NSR lands calculated in 2008 on the SRFF was $2.7 million which is 170% higher that the minimum balance ($996,100)
Productive CLAAG/HARP	Maintain the productivity of stands treated with careful logging (CLAAG) and harvesting around regeneration potential (HARP) techniques	Partially met. Pre and post harvest surveys postponed in 2007, slash was seen to be reducing productivity of portions of many of these stands.
Forest Health	To contribute to the improvement of forest health	Partially met. Upland CLAAG is retaining advanced balsam fir regeneration.
Quality Fibre Sustainability	Employ cost effective renewal and tending treatments that will provide a perpetual and continuous flow of quality wood fibre from the Smooth Rock Falls Forest	Partially Met. 1.1 million annual tree planting target not met due primarily to harvesting underachievement. Annualized average of 530,000 exceeded pro-rated targets. Upland CLAAG is resulting in the retention of balsam fir, larch etc. leading to observed FU shifts beyond what is being modelled. Furthermore upland CLAAG harvesting reduces available area for planting of desirable species.
Herbicide Reduction	Reduce usage through timely field proven science and integrated pest management principles	Partially Met. Annualized average of raw herbicide used was 23% higher than the benchmark average (2,156 kg ai). Raw herbicide used in last two years of the term was 34% less than the benchmark average due to 50% underachievement of planned tending area.

Objective		Assessment - Auditor Comments
Conservation of Soil and Water Resources Objectives		
Water and Aquatic Habitat Quality	Minimize impacts on water quality and aquatic habitat within areas of harvest, renewal, tending and access operations	Met. Several AOCs were developed to meet this objective and AOCs were maintained during operations. Water crossings were well done.
Global Ecological Cycles Objectives		
Forest Conversion	Ensure that the available forest is protected from sustained deforestation or conversion to other uses.	Partially met. Areas covered with slash may be deforested for decades.
Multiple Benefits to Society Objectives		
Wood Flow	Supply industrial and consumer wood needs while maintaining forest sustainability, (CFSA, PFSF) and to realize a predictable, continuous and consistent flow of roundwood from the Smooth Rock Falls Forest	Met
Fur bearer Habitat	Enhance fur bearer habitat on the unit.	Met
Other Values	Ensure the protection of non timber uses on the land base. (CFSA, PFSF)	Met
Society's Responsibility for Sustainable Development Objectives		
First Nations	Building relationships with First Nation communities	Met
Non-timber Values	Insure the appropriate protection of non-timber values Identified on the landbase.	Met. Values surveys were completed and appropriate AOC prescriptions developed.
Maintaining and Enhancing Frameworks for Sustainable Forest Management		
Legislative and Regulatory Compliance	Ensure compliance with legislative and regulatory requirements, which contribute to the sustainable management of Ontario's forests	Met
Planning Inventory	Make available the most accurate and detailed resource inventories for use in future forest management plans	Met
Monitoring	Provide information from which to assess and report on forest sustainability.	Partially Met. FSC certification achieved however significant underachievement of monitoring targets during terms including FTG surveys, NSR assessments and post harvest assessments.
Research and Development	Assess what products of the Forest Research Partnership or any other sources of Research & Development that might result in gains in allowable cut affect or other improvements in forest management performance.	Met. Research products included; • Data standardization and validation exercise so as to facilitate data manipulation and comparison over broad regional landscapes. • Investigation and development of forest inventory tools • Yield curve benchmarking

Appendix 3 – Compliance with Contractual Obligations –

The following table provides the conditions of SFL No. 541841 for the Smooth Rock Falls Forest. Each condition is provided on a separate row with comments by the audit team to report on the degree of attainment of the condition.

Licence Condition	Licence Holder Performance
Payment of Forestry Futures and Ontario Crown charges	Met. Payments were made as required.
Wood supply commitments, MOAs, sharing arrangements, special conditions	Met. Wood available for most supply agreement and MOUs but market downturn and mill closures.
Preparation of FMP, AWS and reports; abiding by the FMP, and all other requirements of the FMPM and CFSA	Met
Conduct inventories, surveys, tests and studies; provision and collection of information in accordance with FIM and in the case of the Agreement in accordance with the Algonquin Forestry Authority Act	Met. FTG surveys conducted in accordance to FIM
Wasteful practices not to be committed	Met. Utilization observed to be very good.
Natural disturbance and salvage SFL conditions must be followed	Met
Protection of the licence area from pest damage, participation in pest control programs	Met. No eligible pest management program occurred during the term of the audit.
Withdrawals from licence area	Met. No withdrawals have occurred.
Audit action plan and status report	Partially met. An audit action was prepared, approved and implemented and a status report was prepared as per SFL requirement. Action plan submitted approximately one year late; Status report submitted approximately 5 months late
Payment of forest renewal charges to Forest Renewal Trust (FRT)	Met. Payment of forest renewal charges where made to the FRT during the term as required.
Forest Renewal Trust eligible silviculture work	Met. Field examination of FRT invoiced areas showed that the silviculture work was eligible.
Forest Renewal Trust forest renewal charge analysis	Met. Multiple analysis of silvicultural liability on the SRFF were done throughout the term by the MNR and Tembec.
Forest Renewal Trust account minimum balance	Met. Forest Renewal trust for the SRFF met the required minimum balance ($996,100) for the audit period. The FRT balance as of March 31, 2010 (~1.15 million) is significantly lower than the calculated silvicultural liability on the forest ($2.7 million). The consolidated minimum balances for the former Smooth Rock Falls, Cochrane Moose River, Iroquois Falls and Nighthawks Forest are being carried forward for the newly amalgamated Abitibi River Forest. An analysis of current silvicultural liability on the ARF is being done by the Cochrane District MNR. It is anticipated that this data will contribute to the determination of a minimum balance which accurately reflects present day silvicultural liability and the cost of all outstanding contractually obligated renewal commitments in the event of license forfeiture.
Silviculture standards and assessment program	Not Met. Data from FTG surveys indicate acceptable regeneration success (90%) however silvicultural success is quite poor (55%). Field observations, District SEM reports and the TAR indicate that upland CLAAG harvesting patterns and the mature Larch retention are primary contributors to the observed FU shifts. Two recommendations address these issues.

	Only 38% of planned FTG surveys were achieved during the term. Tembec's SEM program on the SRFF was curtailed in 2007 contributing to a backlog of naturally regenerated areas requiring surveying.
Aboriginal opportunities	Met. Numerous opportunities provided by Tembec and MNR.
Preparation of compliance plan	Met. Compliance planning completed
Internal compliance prevention/education program	Met. Prevention/education programs implemented
Compliance inspections and reporting; compliance with compliance plan	Met. Adequate level of inspections conducted
SFL forestry operations on mining claims	Met. Notices sent to claim holders
SFL or Agreement extension recommendation	Met. Licence extension recommended in 2005 IFA – licence replaced by Abitibi River SFL in 2010.

Appendix 4 – Audit Process

The Independent Forest Audit Process and Protocol (IFAPP) was developed by MNR to provide a comprehensive and consistent method of evaluating forest management activities on Crown land. The IFAPP (2010) states that the purpose of an Independent Forest Audit is to:

a) assess to what extent forest management planning activities comply with the Forest Management Planning Manual (FMPM) and the Crown Forest Sustainability Act (S.O. 1994, c. 25) (CFSA);
b) assess to what extent forest management activities comply with the CFSA and with the forest management plans, the manuals approved under the CFSA and the applicable guides;
c) assess the effectiveness of forest management activities in meeting the forest management objectives set out in the forest management plan, as measured in relation to the criteria established for the audit;
d) compare the forest management activities carried out with those that were planned;
e) assess the effectiveness of any action plans implemented to remedy shortcomings revealed by a previous IFA;
f) review and assess a licensee's compliance with the terms and conditions of the forest resource licence.

The IFAPP is based on eight guiding principles and contains 148 procedures, 136 of which are applicable to the SRFF. Of that number a further 11 procedures were not audited due to sampling or by exemption under the IFAPP. The audit procedure serves as a framework to provide a structured approach to evaluating whether or not forest management activities meet the requirements governing forestry practices on Crown land in Ontario. The guiding principles are:

1. Commitment
2. Public consultation and Aboriginal involvement
3. Forest management planning
4. Plan assessment and implementation
5. System support
6. Monitoring
7. Achievement of management objectives and forest sustainability
8. Contractual obligations

MNR categorized the various IFA procedures based on complexity and their potential impact on forest sustainability. The IFAPP directs the audit team to assess through sampling, per audit principle and associated criteria, the three categories of procedures as follows:

- Administrative procedures – low (L) risk: 20-30% of L procedures to be assessed
- Administrative but also having a bearing on sustainable forest management – medium (M) risk: 50-75% of M procedures to be assessed
- Procedures directly related to sustainable forest management – high (H) risk: 100% of H procedures to be assessed

The lower range of the sample scale may be considered for forests certified in accordance with a sustainable forest management standard accepted by Ontario. The following table summarizes the number of procedures selected by the audit team for audit based on the direction provided by the IFAPP.

Table: Summary of the number of procedures selected by the audit team for audit based on direction provided in the IFAPP.

Principle	Procedures Audited by Risk Category							Comments
	Low Risk			Medium Risk			High Risk	
	Applicable (#)	Selected (#)	% Audited	Applicable (#)	Selected (#)	% Audited	Audited (#) (100% of applicable audited)	
1. Commitment	0	0	-	0	0	0	0	
2. Public Consultation and Aboriginal Involvement	0	0	-	6	5	83	2	
3. Forest Management Planning	6	3	50	12	9	75	41	Applicable procedures *not* audited: 3.2.2.1, 3.5.1.3, 3.6.1.1, 3.6.2.1, 3.6.2.2, 3.7.1, 3.10.2.1
4. Plan Assessment & Implementation	1	1	100	1	1	100	9	
5. System Support	0	0	-	1	1	100	1	Applicable procedure *not* audited: 5.1.1
6. Monitoring	0	0	-	7	4	57	11	Applicable procedures *not* audited: 6.4.2, 6.4.3, 6.5.4
7. Achievement of Management Objectives and Forest Sustainability	0	0	-	2	1	50	15	Applicable procedure *not* audited: 7.1.7
8. Contractual Obligations	0	0	-	0	3	100	18	
Totals	7	4		29	24		97	

The audit process for the Forest consisted of eight main components:

1. Audit Plan: KBM prepared an audit plan that described the schedule of audit activities, audit team members and their qualifications, audit participants, and auditing methods. The audit plan was submitted to MNR, Tembec, AbiBow, FRMG, the Forestry Futures Trust Fund Committee, and the Chairs of the Cochrane, Kirkland Lake and Timmins LCCs.

2. Public Consultation: Several means of engaging consultation for the audit were used. Utilizing the MNR Cochrane District mailing list, KBM mailed letters to numerous parties advising of the audit and inviting their input. Mail-outs included a one-page survey to solicit public input to the audit process. The survey was also available to the general public on the KBM website (www.kbm.on.ca). Newspaper ads were published in six area newspapers prior to the pre-audit meeting advising the public of the upcoming audit, identifying the purpose of the audit and inviting the public to submit comments to the LCC Chair or directly to KBM.

3. Aboriginal Engagement: All seven First Nation groups associated with the amalgamated forest were contacted firstly by mail, then by phone. Personal interviews were arranged with representatives of Beaverhouse and Wahgoshig and telephone interviews were conducted with representatives of Matachewan and Flying Post. Attempts were made to interivew Moose Cree, Taykwa Tagamou and Mattagami but these were unsuccessful. The Cochrane District Manager, MNR Aboriginal Liaison Officers and company staff were also interviewed regarding Aboriginal involvement.

4. Field Site Selection: The audit team conducted a preliminary site selection prior to meeting with Tembec, FRMG and MNR staff. GIS records, Annual Work Schedules and Annual Reports were used to determine the amount and type of forest operations carried out on the Forest during the audit period. A representative sample of sites was then selected to ensure field auditing of a cross section of all activities conducted on the Forest during the audit period. A pre-audit teleconference between MNR, Tembec, AbiBow (for the IFF), FRMG and KBM was held on August 19, 2010. Part of the pre-audit meeting was spent discussing the preliminary site selection and preparation of field packages with the companies and MNR.

5. Pre-audit Document Review: Prior to the September site visit, the audit team reviewed documents provided by Tembec, FRMG and MNR, including the:
   a) SRFF 2005-10 FMP
   b) 2010-12 CP for the Cochrane Area Forest
   c) Annual Work Schedules and Annual Reports associated with the 2005-10 FMP Comparison and Trend Analysis of Planned versus Actual Forest Operations Report (TAR)
   d) SRFF Independent Forest Audit 2000-05 report
   e) SRFF 2000-05 Independent Forest Audit Action Plan and Audit Action Plan Status Report.

   The audit team also developed a questionnaire that was circulated to planning team members and other Tembec and MNR District staff prior to the on-site audit to assess their perceptions regarding the effectiveness of specific components of forest management on the SRFF. The results of the survey provided additional focus to IFAPP prescribed interview procedures that occurred on site.

6. On-Site Audit: The objectives of the field site visits were to confirm that activities were conducted according to plan, that they conformed to Provincial laws, regulations, and guidelines, and that they were effective. The opening meeting was held in Cochrane on September 13, 2010. During the on-site visit portion of this audit, the audit team spoke with staff of Tembec, FRMG, MNR, and LCC members. The audit team examined documents, records and maps at the MNR Cochrane District office, and spent two days in the field viewing selected sites. Representatives of Tembec, FRMG, MNR Cochrane District, MNR Forest Management Branch, and a representative of the Forestry Futures Trust Fund Committee accompanied the audit team during a portion of the field audit.

   Many stops provided the opportunity to audit multiple activities such as harvesting, renewal, values protection, etc. The following table presents the actual sampling intensity for each forestry activity examined on the ground as part of the field site visits. Due to access and time constraints, the audit team relied on a helicopter to reach many of the selected field sites. The helicopter also provided opportunities for overviews of the subject areas, enabling overall examination of target blocks.

7. The closing meeting was held in Cochrane on September 27, 2010. This meeting provided a forum for the audit team to present and discuss preliminary audit findings with Tembec, AbiBow (for the IFF), FRMG, MNR, FFTC and a representative of the Cochrane LCC.

Table: Audit sampling intensity for the Smooth Rock Ralls Forest

Smooth Rock Falls Forest			
Activity	**Total Area or Number (2005-2010)**	**Proposed Sample Area**	**Proposed Sample (%)**
Harvest (ha)	4,152	597	14
Clearcut for Natural Regeneration (ha)	102	71	69
Seed Tree (ha)	271	65	24
CLAAG (ha)	1,125	179	16
Site Preparation mechanical (ha)	93	67	72
Site Preparation chemical (ha)	525	87	17
Plant (ha)	1,974	295	15
Seed Tree (ha)	275	65	74
Tend (ha)	6,701	686	10
Free-to-Grow (ha)	6,650	703	11
Area of Concern Categories (#)	14	3	21
Road Construction (km)	9.7	9.7	100
Road Maintenance (km)	390	48	12
Specified Procedures Review* (ha)	828	239	29

8. Final Report: The audit results are presented in this report following a brief description of the audit process and the forest licence area under review. Within the report the audit team has made recommendations to address instances of non-conformance to a legal and/or policy requirement, or an identified lack of effectiveness in forest management activities. Two Best Practices were also identified for outstanding work.

   Recommendations from this audit must be addressed in an action plan developed by ARFMI and MNR Cochrane District, with input and review by MNR Kirkland Lake and Timmins Districts, and MNR Regional and Forests Branch representatives. MNR Regional and Forests Branch representatives will also develop an action plan to address the recommendations applicable to matters of forest management within the scope of responsibilities of these departments.

Fourteen responses to the public notices and survey were received. Commenter's areas of interest in forest management on the Abitibi River Forest were recreation, conservation, tourism, forest management practices, and Aboriginal rights.

Local Citizens Advisory Committees

Letters were mailed to all current members of the three LCCs on the Abitibi River Forest to notify them of the audit and invite their input. An LCC member attended the preaudit meeting conference call and telephone or in-person interviews were conducted with approximately 10-15% of the LCC members representing all three LCCs. Most had been a member greater than one year, with the majority having served on the LCC for more than four years. Members interviewed represented various stakeholder groups, such as the general public, government, trappers and municipalities. Roles and responsibilities of members were discussed as well as the effectiveness of the group to fulfill the obligations set out in the LCC Terms of Reference. An LCC member attended the closing meeting.

Aboriginal Communities

A letter was mailed to each of the Aboriginal communities on the MNR District contact list inviting them to participate in the audit. The letter explained that their input was welcomed and encouraged them to contact KBM if they wished to participate in the audit or if they required more information before making a decision. Follow-up phone calls were made to further solicit input.

In-person discussions were held with members of Beaverhouse FN and Wahgoshig FN while telephone interviews were conducted with Matachewan FN and Flying Post FN. Both Beaverhouse and Wahgoshig representatives felt the relationship was good with MNR and while the Flying Post representative acknowledged they did not really have any involvement with forest management on the Abitibi River Forest, they wished to be kept informed. Attempts to interview representatives of Moose Cree FN, Taykwa Tagamou Nation and Mattagami FN were unsuccessful. A letter from the Métis Nation of Ontario was received prior to the audit voicing concern that they were not given the opportunity for a separate consultation process during forest management planning. At present the FMPM does not require a separate process be offered to Métis organizations.

The Cochrane District Manager, MNR Aboriginal Liaison Officers and company staff were also interviewed regarding Aboriginal involvement.

Overlapping Licensees, Contractors and Commitment Holders

All businesses listed in the MNR District mailing list were sent the one-page KBM survey and letter soliciting input to the audit. Interviews were held with two commitment holders.

SFL Holder

During the audit term the Forest was managed under an SFL by Tembec, however, at the time of the audit, management of the Abitibi River Forest was being transferred to Abitibi River Forest Management Inc. ARFMI is described as a consortium of forest industries, ranging from small independent logging operators to large forest-products producers. It includes former SFL holders, Tembec and AbiBow. Day to day management is contracted to FRMG. Representatives of ARFMI, including Abitibi-Bowater and Tembec staff, and FRMG participated throughout the audit process. The audit team appreciates ARFMI's and FRMG's efforts in preparing the audit field packages and supporting the audit process.

Ministry of Natural Resources

Interviews were held with Cochrane District staff including the District Manager, Area Supervisor, Area Forester, Area Biologist, Area Technicians and Aboriginal Liaison Officers. MNR District personnel from Cochrane and Timmins Districts also accompanied the audit team during portions of the field audit. The pre-audit meeting and audit opening and closing meetings were attended by MNR District personnel from the three Districts on the Abitibi River Forest. The audit team appreciates the cooperation and assistance provided by MNR Cochrane District staff in preparing the audit field packages and coordinating the field site visits.

One MNR Northeast Region representative participated in the preaudit meeting, portions of the on-site audit and the closing meeting. Two representatives from MNR Forest Management Branch attended portions of the on-site audit and the Branch was also represented during the pre-audit meeting and closing meeting.

Forestry Futures Trust Fund Committee

Representatives from the Forestry Futures Trust Fund Committee participated in the pre-audit meeting via conference call, two representatives attended portions of the on-site audit, and one representative attended the closing meeting via conference call.

Appendix 5 – List of Acronyms

ACOP	Annual Compliance Operating Plan
AOC	Area of Concern
AR	Annual Report
ARFMI	Abitibi River Forest Management Inc.
AWS	Annual Work Schedule
CLAAG	Careful Logging Around Advanced Growth
CFSA	Crown Forest Sustainability Act
CP	Contingency Plan
CSA	Canadian Standards Association
CSP	Chemical Site Preparation
EMS	Environmental Management System
EP(EMSLA)	Environmental Professional (Environmental Management System Lead Auditor)
FFTC	Forestry Futures Trust Fund Committee
FMP	Forest Management Plan
FMPM	Forest Management Planning Manual
FOIP	Forest Operations Information Program
FOP	Forest Operations Prescription
FRI	Forest Resource Inventory
FRMG	First Resource Management Group
FRTF	Forest Renewal Trust Fund
FTG	Free-to-Grow
GIS	Geographic Information System
HARP	Harvesting with Advanced Regeneration Protection
IEA	Individual Environmental Assessment
IFA	Independent Forest Audit
IFAPP	Independent Forest Audit Process and Protocol
IFF	Iroquois Falls Forest
KBM	KBM Forestry Consultants Inc.
LCC	Local Citizens Committee
LTMD	Long term management direction
MNR	Ministry of Natural Resources
MOA	Memorandum of Agreement
MOE	Ministry of Environment
NSR	Not Satisfactorily Regenerated
RCCIM	Regional Community Constellation Impact Model
R.P.F.	Registered Professional Forester
RSA	Resource Stewardship Agreement
SEM	Silvicultural Effectiveness Monitoring
SEIM	Socio-Economic Impact Model
SFL	Sustainable Forest Licence
SGR	Silviculture Ground Rule
SIP	Site Preparation
SMA	Selected Management Alternative
SRFF	Smooth Rock Falls Forest
SSG	Stand and Site Guide
TAR	Comparison and Trend Analysis of Planned vs. Actual Forest Operations Report

Appendix 6 – Audit Team Members and Qualifications

Name/Role	Mr. Rod Seabrook • Lead Auditor • Public Consultation
Responsibilities	Overall audit coordination and oversight of activities of the audit team; including public consultation; lead the assessment of achievement of management objectives, forest sustainability and contractual obligations.
Credentials	M.Sc. Biology; EP(EMSLA); 30 years forestry experience in Ontario; principal area of practice is forest management and environmental auditing; accredited by the Canadian Environmental Certification Approvals Board as an Environmental Professional specialized as an Environmental Management Systems Lead Auditor with a focus in Sustainable Forestry Management; member of the Auditing Association of Canada; Associate member of the Ontario Professional Foresters Association; eleven years of auditing experience; participated in over 20 Independent Forest Audits for the Province of Ontario. IFA experience covers all Crown managed forest types in Ontario; conducted sustainable forest management audits under the various recognized sustainable forest management standards in Alberta, Saskatchewan, Manitoba, Ontario, New Brunswick, Minnesota, South Carolina, Georgia, Mississippi, Alabama, and Texas; participated in over 100 3rd party audits to ISO 14001, CSA Z809, SFIS, FSC, and Chain of Custody standards.
Name/Role	Mr. Peter Higgelke • Wildlife/Ecology/Planning
Responsibilities	Inspect AOC documentation and practices; audit aspects of forest management related to environmental protection and wildlife practices; review access management program; review aspects of planning; assess achievement of management objectives, forest sustainability and contractual obligations
Credentials	R.P.F., M.Sc.F.; 29 years forestry experience in Ontario, Quebec, and Germany; served on one FMA Review and 16 IFAs, under a range of audit roles including Lead, Harvesting, Silviculture, Wildlife and Planning Auditor as well as auditing under FSC, including three forest management certification audits, three forest management scoping audits, six forest management surveillance audits and one chain-of-custody audit; completed ISO 14001 EMS Lead Auditor training through the Quality Management Institute in April 2006. Extensive knowledge and experience with wildlife and forest management as well as Aboriginal communities; interim plan author for the Lake Nipigon Forest 2010-20 FMP; primary areas of practice and disciplinary expertise are forest management, application development for the use of GIS technology in forest management, the integration of timber management and wildlife values, public participation in forest management planning, and participation by Aboriginal communities in forest management.
Name/Role	Mr. Laird Van Damme • Planning
Responsibilities	Assess adherence to forest management planning requirements; assess compliance and monitoring programs; assess achievement of management objectives, forest sustainability and contractual obligations
Credentials	R.P.F., M.Sc.F.; 23 years experience as a practising forester, educator and consultant; primary areas of practice are in the disciplines of silviculture, forest management and forest research; completed ISO 14001 EMS Lead Auditor training course through the Quality Management Institute; served as a forestry auditor on 14 previous IFAs and several certification audits; Lead Auditor on two IFAs; led the Model Forest Program evaluation and the last

	National Forest Strategy evaluation; authored four FMPs and published numerous scientific and professional papers as an adjunct professor at Lakehead University; consultant to the government of Saskatchewan on forest management planning standards and landscape planning projects in Alberta; peer reviewer of forest management plans and certification audits.
Name/Role	Mr. Brad Chaulk • Harvesting
Responsibilities	Assess harvest planning and operations, compliance and monitoring programs; assess achievement of management objectives, forest sustainability and contractual obligations.
Credentials	R.P.F., H.B.Sc.F.; 17 years of forestry experience; areas of particular experience include silvicultural practices and inventory systems including project management; diverse experiences as a tree plant supervisor, head of propagation and seedbed foreman at one of Ontario's largest nurseries, and as the supervisor and manager of technical services at KBM; member on 14 IFA teams; prepared pre-harvest and post-harvest forest operating prescriptions and developed preferred harvest strategies, site preparation techniques, and planting/tending regimes for individual harvest blocks; completed Managed Forest Tax Incentive Program plans for private landowners; conducted and written wood supply reports/timber analyses; considerable experience using the Forest Ecosite Classification systems for both Northwestern and Northeastern Ontario as well as the new Harmonized Ecosite Classification System for the Province; co-author Field Guide to Second Generation Progeny Test Establishment, Management and Assessment; plan author for the Black Sturgeon Forest 2006-2026 FMP; lead author of the Silvicultural Ground Rules for the Dog River-Matawin 2005-2025 FMP; project manager for both the Lake Nipigon Forest 2010-20 FMP and the English River Forest 2009-2019 FMP; certified to interpret aerial photography in Ontario's Boreal Forest; taught forest management planning at Confederation College.
Name/Role	Mr. Stephane Audet • Silviculture
Responsibilities	Assess renewal, tending and protection planning and implementation as well as silviculture monitoring, achievement of management objectives, forest sustainability and contractual obligations.
Credentials	R.P.F., with ten years of experience in the forestry sector. Primary focus on silviculture through managing site preparation activities, conducting forest inventory, regeneration and FTG surveys, tree improvement activities, cut block and road layout; contributed to a number of forestry consulting projects including wood supply analyses, customized operational costing matrices and wood supply contracting; silviculture auditor on the 2009 Trout Lake IFA.
Name/Role	Mr. Keith Hautala • Modelling
Responsibilities	Review SFMM strategic planning; assist in assessment of achievement of management objectives and forest sustainability.
Credentials	M.Sc.F.; 11 years of forestry experience in Ontario with an emphasis on long-term forest management planning, wildlife habitat analysis, strategic-level forest modelling, and forest auditing; participated in six IFAs in the position of Forest Modelling Auditor and an additional four as Secretariat; auditing responsibilities included reviewing assumptions, composition, and documentation of long-term strategic models, examining development and evaluation of management alternatives, and assessing achievement of management objectives and forest sustainability; teaches plant biology and wildlife courses at Confederation College.

Name/Role	Ms. Mary Anne Seabrook • Aboriginal Involvement
Responsibilities	Aboriginal involvement in forest management planning.
Credentials	Business Diploma. Ojibway descent; member of Red Rock Indian Band, located east of Thunder Bay. Strong background of working with First Nations organizations including the Ontario Metis and Aboriginal Association, the Red Rock Indian Band, Meno Bimahdizzewin Child and Family Service; served on Board of Directors for Native People of Thunder Bay Development Corporation; served as the team secretary on the Red Rock Indian Band Hydro Negotiating Team; involved in interviewing Michipicoten First Nation members to assess their skills and training requirements against work experience required for apprenticeship trades. Auditor on both IFA and FSC audit teams covering a total of seven audits.
Name/Role	Ms. Caleigh Sinclair • Audit Secretariat
Responsibilities	Provide general support in the execution of the IFA including logistics, evidence gathering, and report development. Assists in review of public consultation procedures and preparation of audit reports.
Credentials	H.BSc Biology; worked on a sea lamprey control program, as a resource technician, assistant planning biologist, acting planning biologist and renewable energy coordinator for the Ontario Ministry of Natural Resources. Currently main area of focus with KBM is renewable energy and environmental assessment projects.

Appendix 7 – Comparison and Trend Analysis Report

Comparison and Trend Analysis of Planned Versus Actual Forest Operations Report

for the

2010 Independent Forest Audit of the Smooth Rock Falls Forest SFL# 542531 Cochrane District, Northeast Region

1570
P. D. FANTIN

Prepared by: Paul Fantin
Paul Fantin, R.P.F.
Forest Program Manager
First Resource Management Group
(Acting as agent for Abitibi River Forest Management Inc.)

Date: August 19, 2010

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Introduction

This report was prepared as part of the 2010 Independent Forest Audit of the Smooth Rock Falls Forest (SRFF) for the April 1, 2005 to March 31, 2010 audit term. The purpose of the audit is to assess compliance of forest management with the Crown Forest Sustainability Act, its regulated manuals the forest management planning process, and planned versus actual forest management activities. Continual improvement of these activities is facilitated through the identification of a series of recommendations, suggestions, and best management practices.

The scope of this trend analysis includes forest management activities from the audited period plus the three proceeding operational terms. Specifically the period from 1990-1995 and the period from 1995-2000 and 2000-2005 are included in the analysis in addition to the recently completed 2005-2010 term. The comparison of these periods permits the development of a level of understanding of the evolving management practices on the Smooth Rock Falls Forest.

The 1990 to 1995 Timber Management Plan was written by the Ministry of Natural Resources. Primarily Ministry staff from the district office in Cochrane conducted forest management activities, including compliance and reporting. Malette Inc. was the primary company conducting harvesting operations, with wood fibre going to the Malette pulp mill in Smooth Rock Falls and the Malette sawmill and waferboard mill in Timmins.

The 1995 to 2000 period saw several changes in the management of the Smooth Rock Falls Forest. Planning of activities for this term was a joint endeavor between Malette Inc. staff in Timmins, and Ministry District staff in Cochrane. Forest management activities were to be conducted jointly between Ministry staff and Company employees. On September 14, 1995 Malette Inc. received a Sustainable Forest License (SFL) under the Crown Forest Sustainability Act and assumed full responsibility for achievement of the management objectives of the 1995-2000 Plan. Later that year Tembec Industries Inc., (at that time Tembec Inc.), purchased Malette Inc. and held the license for the Smooth Rock Falls Forest.

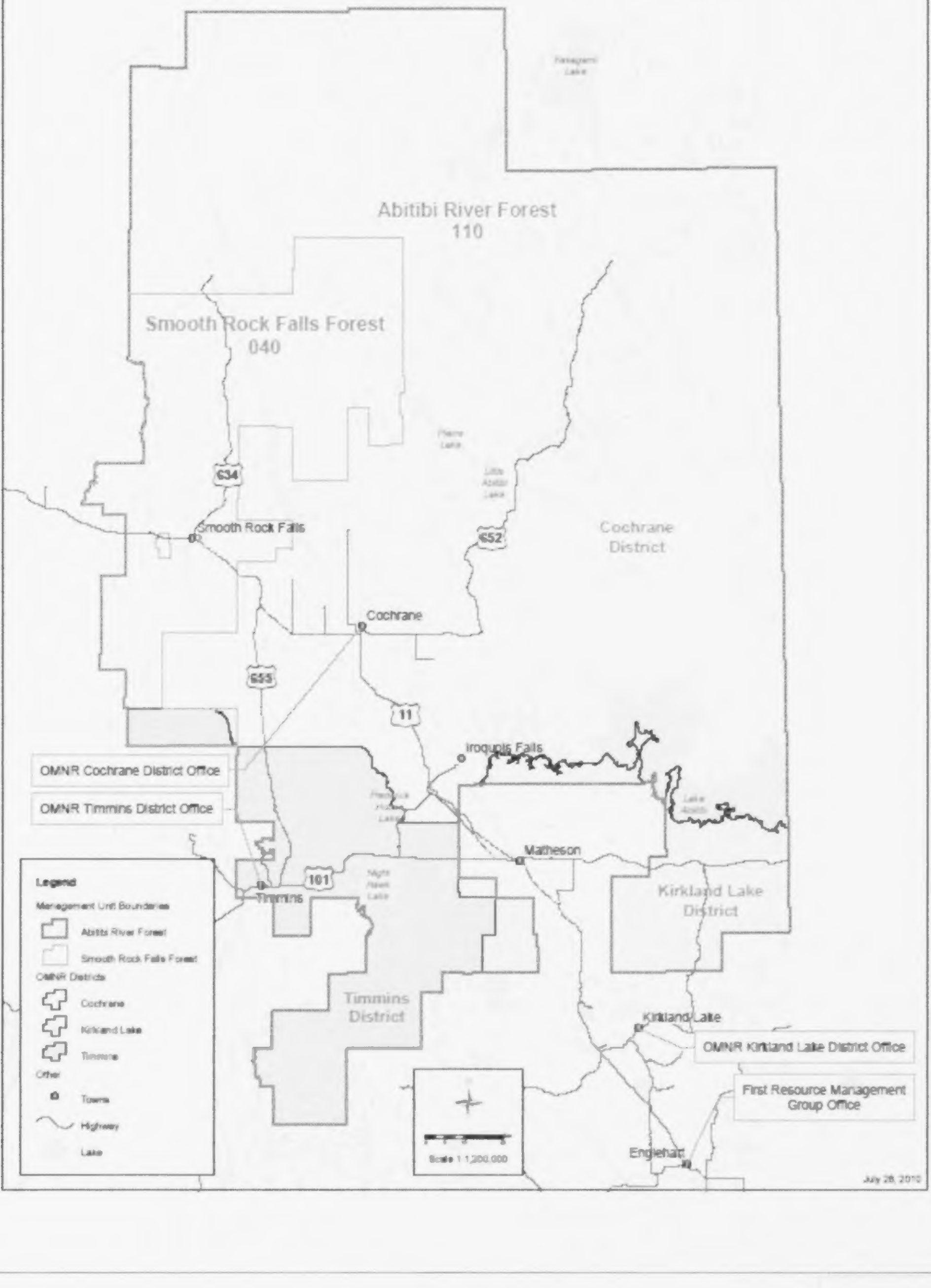
The 2000 to 2005 and the 2005 -2010 Forest Management Plan (FMP) were written under the 1996 Forest Management Planning Manual. Tembec Industries Inc. led the writing of these plans and was primarily responsible for achieving the forest management objectives set out in the plan. With respect to forest management activities, Ministry staff in Cochrane District assisted in the development of the FMP's and focused on reviewing amendment and revision requests, reviewing annual work schedules and annual reports, and conducting compliance audits of Company activities.

The current and past Forest Management Plans (FMPs) and the past Timber Management Plans (TMPs), the Forest Resource Inventory (FRI), the Report of Past Forest Operations (RPFO), the Annual Reports (AR) and the forest planning system have contributed to the preparation of this Trends Analysis Report.

The Smooth Rock Falls Forest is part of the Ministry of Natural Resources Cochrane administrative District, Northeast Region. It currently provides fibre to local mills in the towns of Cochrane, Kapuskasing and Timmins. With an area of over five hundred thousand hectares the Smooth Rock Falls Forest (the Forest) has 25 townships and three unsurveyed areas in District of Cochrane, 2 townships in Hearst District, and 3 townships in Timmins District. Cochrane is the administrative district responsible for the planning of forest management activities on the Forest. The Forest is oriented north-south and spans 120 kilometres from Abitibi Canyon in the north to a point halfway between the towns of Smooth Rock Falls and Timmins in the south. At its widest point the Forest is approximately 70 kilometres wide. The Town of Smooth Rock Falls is situated approximately in the middle of the Forest. The location of the Smooth Rock Falls Forest is illustrated on Figure 1.

Tembec Industries Inc. administered the Smooth Rock Falls Forest until January, 2010 when First Resource Management Group (FRMG) assumed the management responsibilities for the landbase. As of April 1, 2010 the Smooth Rock Falls Forest was amalgamated with the Nighthawk Forest, the Iroquois Falls Forest and the Cochrane Moose Crown Management Unit into a single forest area named the Abitibi River Forest. As such, the 2010 IFA will be the last audit of the Smooth Rock Falls Forest. At the time of this report preparation the SFL for the new amalgamated forest was being issued to Abitibi River Forest Management Inc. (ARFMI), a new cooperative based management company comprised of forest industry producers, forest harvesting companies and First Nations. The management of this SFL area is being carried out by FRMG under contract to ARFMI.

Figure 1 - Smooth Rock Falls Forest Management Unit


Kesagami Lake
Abitibi River Forest 110
Smooth Rock Falls Forest 040
Pierre Lake
Little Abitibi Lake
634
652
Smooth Rock Falls
Cochrane District
Cochrane
655
11
Iroquois Falls
OMNR Cochrane District Office
OMNR Timmins District Office
Frederick House Lake
Lake Abitibi
Matheson
101
Timmins
Night Hawk Lake
Kirkland Lake District
Timmins District
Kirkland Lake
OMNR Kirkland Lake District Office
First Resource Management Group Office
Englehart
Legend
Management Unit Boundaries
Abitibi River Forest
Smooth Rock Falls Forest
OMNR Districts
Cochrane
Kirkland Lake
Timmins
Other
Towns
Highway
Lake
Scale 1:1,200,000
July 28, 2010

4.1 Implementation of Forest Operations - Trend Analysis

4.1.1 Harvest Area

The planned and actual harvest area figures reported in Table AR-7 were based on the RPFO Table 4.1, RPFO-1, or Table 4.15 for the 1990-1995 and 1995-2000 periods. The 2000 and 2005 planned figures were based on FMP-18, while the actual harvest and natural depletion areas were based on annual report data.

Both the 1990 and 1995 TMPs used forest units based on working group and site class. There were three spruce forest units: Spruce 1, Spruce 2 and Spruce 4 which attempted to separate the spruce upland, spruce slope and spruce lowland spruce sites. The entire poplar working group was included in the Po forest unit, all birch in Bw forest unit and jack pine in Pj forest unit. In the 2000 FMP the forest units increased in complexity and moved from simple working group and site class amalgamations to complex groupings based on working groups, species composition, stocking and site class. This increased the forest units to ten. For the 2005 FMP further refinement occurred with the adoption of forest units based on the suite of northeast regional standardized forest units. This allowed classification of sites based to include forest cover types that could also be more closely compared to wildlife habitat types and eco-site classification.

Table AR-7 indicates the approximate grouping of the current forest units into the past plan forest units for comparison purposes. Since the forest units have changed between plans since 1990 it is difficult to make individual forest unit comparisons and establish meaningful trends. All data is shown on an annualized basis, planned and actual area harvested for the periods 1990-1995, 1995-2000, 2000-2005 and 2005-2010. Information in the table is obtained from the RPFOs and annual reports produced for these time periods. The numbers for the 2005-2010 period are annualized for the four years that have been reported to date.

For the period 1990-1995, seventy-five percent of the available harvest area was cut. Concentration on lower volume stands with a greater quantity of sawlogs meant that stands with high volumes of aspen or dense pulp stands were bypassed. This harvest area was able to supply 60% of the planned volume.

During the 1995-2000 period, 81% of the area available for harvest was harvested. The main reason for this level of harvest is that the planned volume was achieved. A dispute regarding the harvest of a particular area southeast of Fraserdale during the last year of the term resulted in area not being harvested and contributed to the lower than planned harvest area for the FMP.

For the 2000-2005 period a combination of contractor capacity and market condition led to lower than planned harvest levels (47%).

The PoPur forest unit shows a substantial under-achievement in harvest over the five years of the 2000 FMP. One cause for under-harvest of this forest unit was the poor health and condition of the aspen in several of the FMP allocations and the resultant bypass of those areas. Mortality and reduced quality of the aspen fibre was associated with aspen decline, which was first noted on the Forest in 2000 following the writing of the 2000-2005 FMP and associated harvest selection. The significance of aspen decline within the forests of the Northeast Region resulted in the establishment of a Regional Task Team. The stands for the 2005 FMP were selected for harvest based on vigour, i.e. those that exhibit some decline but are still merchantable should be the first priority for harvest. To date since 2005 the harvest of the poplar forest area has been focused on the decline area.

For the 2005 -2008 period actual harvest on the forest represented only 26% of planned The under-harvest is apparent across all of the forest units and can be attributed to poor markets for softwood lumber, pulp and paper, oriented strand board and hardwood plywood as a result of the recent global economic recession spurred by the collapse of the housing market in the United States and to a lesser extent Canada. Contributing to this was the countervailing duty applied to softwood lumber as well as the increase in the value of the Canadian dollar against the American currency making exports to the United States less attractive. In addition, high fuel and electricity costs and insurance premiums all conspired to increase production costs at a time when prices for forest products were in steep decline. Finally, in an attempt to minimize operational costs, some companies focused on sourcing fibre as close to the mill as possible in order to reduce haul costs thereby leaving more distant areas unharvested. Throughout this period the facilities in Cochrane, Timmins and Englehart as well as smaller mills all took operational downtime due to the lack of markets for their products. In addition the Tembec Industries kraft mill was closed permanently on July 31, 2006. While the final 2009-2010 annual report information had not been compiled at the time this trend analysis was completed is likely that this trend will persist through to the end of the five-year term.

4.1.2 Harvest Volume

Table AR-8 provides a summary of the annualized planned and actual volumes for the four plan periods. Volume for the 2005-2010 period is based on the first four completed annual reports for that period. The final report will be written in November 2010 and submitted to the MNR Cochrane District for review and comment.

Actual harvest volume for the 1990-1995 period was less than planned (62% and 13% for conifer and hardwood respectively). Contributing factors were the modernization of the Smooth Rock Falls kraft mill and a decision based on market conditions to maximize sawlog production. Therefore, the Company (Malette Inc.) gave a higher priority for harvest to other volume on other forests.

Harvest volumes for the 1995-2000 period are drawn from the annual reports for that TMP. Volume achieved was higher than planned (105% and 103% for conifer and hardwood respectively). A contributing factor was the harvest of several mixed-wood sites. Often these sites provided higher than expected conifer volumes as a result of the understory component of the stands not being well represented in the stand description of the forest resources inventory.

The achieved volume for the 2000-2005 period is roughly one half of the volume available in the FMP (i.e. 50%and 49% for conifer and hardwood respectively). This level is related to the total area harvested within the plan period. Per hectare volumes were generally close to those predicted, however, stand age and stem size were generally an issue. During the planning for the 2000-2005 FMP, age classes of black spruce forest units, which the SFMM was targeting, could not be accessed in the quantities required. As a result, younger stands that were eligible were selected for harvest. However, the diameter of many of the trees in these stands, while merchantable under the scaling manual, was not sufficient to provide a economic source of furnish for the sawmills. To adapt to the small stem size Tembec adopted a practice of enhanced careful logging. When applying enhanced careful logging: as many 10 cm and 12 cm trees are as possible are left unharvested between machine trails, concentrations of small diameter trees are avoided and,
all merchantable pieces harvested are transported to a mill for scaling and use.
Through implementation of enhance careful logging the post harvest stand contained more residual snag structure, greater seed source of natural black spruce seed and, higher post harvest stocking. Overall fewer small diameter logs were delivered to the mills and increased regeneration success is expected. Tembec had been developing the capacity of the harvesting contractor for these areas and improvement from the beginning of the period is noticeable.

For the 2005-2010 period only 20% of the planned harvest volume has been utilized. Based on expected outcomes from the 2009-2010 annual report it is unlikely that this assessment will change significantly. This volume figure relates well to the 26% of the allocated harvest area actually harvested during the period. The rationale for this underachievement is described in 4.1.1.

4.1.3 Renewal and Maintenance

Table AR-9 provides a comparison of renewal, tending, and protection operations for the four plan periods. The sources of this information are Table RPFO-7 and Table FMP-25 for the 1995-2000 period, Table 4.4 and Table 4.19 for the 1990-1995 period, Table FMP-25 and the annual reports for the 2000-2005 period and annual report data for the 2005-2010 period (to 2008-09).

Natural regeneration for the 1990-1995 period falls short of the forecast area in the TMP. The 1995 RPFO noted that only 8% of the planned natural regeneration was achieved. Careful logging practices were begun on the forest during this time and resulted in a decrease in the use of strip and block treatments. Careful logging was not specifically reported as a separate activity nor was this practice reported as a clear-cut. Essentially the information was left out of the annual reports and consequently the RPFO.

Reported levels of natural regeneration for the 1995-2000 period increased to 65% of the planned forecast. Again the actual natural regeneration level was higher but area was not reported as natural regeneration. Eighty percent of forecast harvest occurred and it should therefore follow that roughly 80% of forecast natural regeneration occurred.

Natural regeneration levels for the 2000-2005 period were 45% of the forecast level. Several areas had not had the renewal decision confirmed during the final two years of the period. Furthermore, the majority of the unharvested portion of the AHA was from forest units that are typically regenerated naturally.

Up to 2005 the following trends in natural regeneration levels over time may be supposed: reporting is generally more complete in later periods, and approximately two-thirds of the harvest area is being regenerated naturally due to specific ground conditions that make natural regeneration the best treatment.

For the 2005-2010 period the four years of actual operations are reported. To date only 17% of the planned area has been declared as naturally regenerating. This trend to date can be attributed to two issues. First, the total actual harvest for the period is only 26% of the planned and secondly, survey work on recent harvest area had been postponed due to budget and staffing constraints. For the 2010 AWS year, a survey of recently harvested area will be conducted on the entire Abitibi River Forest, at which time much of the area currently not assessed as naturally regenerated will be classified and reported in subsequent annual reports.

For the 1990-1995 term 75% of planned artificial regeneration levels were achieved. Considering that harvest levels were 59% of that planned, this level of artificial regeneration was an over achievement. However, treatment was likely applied to sites that would benefit most from the investment, such as sites of higher productivity and those with good access.

During the 1995-2000 period 58% of planting and none of the forecast seeding occurred for a combined achievement level of 44%. This continued the trend away from aerial seeding of black spruce. Artificial regeneration levels for this period were low. Several explanations may be found in the declining roll of government in planning silviculture activities, the switch of companies and philosophy regarding forest management, and most likely a time lag as Company employees became familiar with new responsibilities and the challenges of the Smooth Rock Falls Forest. However, the end result was that artificial renewal levels were lower than planned in the 1995-2000 Timber Management Plan.

During the 2000-2005 FMP the trend away from aerial seeding was completed with no seeding of black spruce forecast, however, an annualized figure of 126 hectares/yr of seeding were completed. There existed a sufficient quantity of collected seed to support this achievement at the time and for the 2005 period the practice continued with 110.4 ha/yr seeded to date. Seeding was utilized as a method for economically increasing future stocking levels where planting is of low benefit and natural regeneration could be improved on. Planting levels during this period were 69% of the forecast by area. Over 4.6 million seedlings were planted during this time, 400 thousand less than forecast. Compared to lower than planned harvest levels this level exceeds the target. Sites that would benefit from artificial treatments were treated to a similar level of that of the 1990-1995 period. Given that 78% of the forecast area was planted with 90% of the forecast seedlings, better than anticipated densities were achieved.

For the 2005-2010 period planting levels achieved 54% of planned. Again, underachievement of planting targets can be attributed to lower than expected harvest levels.

Up to the 2005 period the planning trend for regeneration appears to be approximately two-thirds natural regeneration and one-third artificial treatment including aerial seeding. The 2005 FMP target specifies 78% of the renewal area is to be regenerated via natural regeneration and 22% by intensive artificial means reflecting the significantly large proportion of the landbase that are conifer (i.e. spruce) base forest units.

Mechanical site preparation with heavy machinery (D8 bulldozer) has been the historic method of site preparation on the forest. Planting obstacles such as stumps and brush are systematically striped away along with a portion of the litter or organic layer in a shear-blading operation. Advance regeneration is also removed where the machinery operates.

Table AR-9 shows an achievement level of 42% for site preparation during the 1990-1995 period. Limited funding was identified in the RPFO as the key factor for the shortfall. Mechanical site preparation did reach 74% of the planned level. The remainder of the shortfall was due to none of the prescribed fire or chemical site preparation occurring.

The 1995-2000 period had only mechanical site preparation planned with 10% of this occurring.

For the 2000-2005 period only mechanical site preparation was planned and at less than one-third of previous levels. Total achievement of site preparation was 98% of the forecast level with chemical and prescribed fire contributing roughly 40% of the total. While an expensive prescription for forest renewal, during this period, mechanical site-preparation was no longer constrained by funding support with the existence of the forest renewal trust fund. Rather, the desire to have a less intrusive 'foot-print' on the landscape led to the examination of more chemical site preparation, either applied from ground based air-blast machinery or from aircraft. The level of prescribed burning reported is consistent with slash reduction activities and not broadcast burning.

For the 2005 period mechanical SIP has been carried out at 25% of planned levels which is equivalent to the level of harvesting that has taken place during the same time.

The use of Chemical SIP continues to be utilized even though there was no planned figure included in the 2005 FMP. Future FMP's for the Abitibi River Forest will be required to reflect the actual use of chemical SIP in the renewal program. Chemical site preparation is likely to increase in use as a method to provide a competition free, nutrient available planting area that will contribute increased forest productivity to a greater extend then obtained with shear blade treatments. Shear-blading is anticipated to continue as a specialized tool that will be applied where other methods are not sufficient to prepare the site and provide desired density levels. The use of prescribed fire will likely continue, but, at this time is likely only for the management of logging residue.

Forecast tending levels have remained relatively constant for the first three periods of this analysis. Achievement for the 1990-1995 period was 87% of the forecast level. In the 1995-2000 and in the 2000-2005 periods achievement were 87% of forecast levels. The relationship of forecast tending levels with harvest levels does not appear strong, but rather to be set independently.

In the 2000-2005 period the amount of aerial tending was aligned with the area planted. This relationship is likely to continue with a majority of the areas artificially regenerated forecast to receive a tending treatment.

For the 2005 – 2010 period achievement of target levels for tending are at 95% of planned after four years.

Tembec Industries Inc. is attempting to reduce herbicide use in tending across their forest licenses. To meet this goal a number of approaches are being considered including varying the rate of application of the chemical and reducing the need to treat organic forest types through the minimization of site disturbance. In the short term, the trend of treating one-third of areas harvested is likely to continue.

The 2000-2005 period is the only one of the three periods in this analysis in which ground tending was forecast. Approximately one-quarter of the forecast area was treated. The benefit of ground tending is as a tool for mixed-wood management. Other techniques, such as aerial strip spraying are believed to be as effective at producing a mixed-wood condition and are more cost effective. Low levels of ground tending are likely to continue.

4.1.4 Harvest and Regeneration

Table AR-10 provides a summary of harvest and regeneration trends. Of the 14,657 hectares depleted by harvest between 1990 and 1995, 11,599 have been surveyed. 89% of this area is Free to Grow (FTG) and 11% is Not Sufficiently Regenerated (NSR). The majority of these assessments were conducted between 2003 and 2005. Of those sites that are FTG the stocking level of the new forest was on average greater than the average for the whole forest. With the exception of the Aspen, Cedar, and Larch working groups, which all increased, the difference is greater than 10%.

Sites that were NSR most often required a tending treatment to remove overtopping vegetation followed by a reassessment in the year following the tending but were otherwise well stocked with seedlings. In most other NSR cases the regenerating forest was free of competing vegetation but was slower growing due to onsite characteristics of organic soils. Site class 3 black spruce typically requires slightly longer than the 'standard' ten year period used to create the numbers in this table. Tembec Industries Inc. applied the principles of careful logging in order to preserve advance growth that exists on these sites at the time of harvest in order to return sites to the productive landbase as quickly as possible.

During the 1990-1995 period the general approach to renewal of the forest was to examine the area after harvest and prescribe a set of treatments that would establish a new forest. Often, the treatment involved increasing the component of conifer on all but the mixed-wood and hardwood sites which were expected to regenerate to aspen dominated stands. It is therefore difficult to draw any conclusion regarding trends of forest unit conversions during this period other than to note that mixed forest conditions were generally moved, through active or passive treatments, to either more pure conifer or hardwood forest types.

For the 1995-2000 period currently 9811 ha (50.2%) are regenerated.

Difficulty with respect to post harvest alder competition on fresh black spruce sites has been an issue that has been addressed through the use of herbicides.

4.1.5 Forest Condition

Table AR-11 provides a summary of forest conditions for the available managed Crown productive forest for the current plan and the previous three plans. The intent is to evaluate how both the total forest unit area and forest unit age class structure has developed and to draw trends from this data that may be useful in describing the effectiveness of forest management objectives over time. Drawing trends from this information is difficult since the forest units have changed significantly enough since 1990 to preclude a direct comparison between planning periods. Forest units have evolved from those based primarily on FRI working group to forest units that attempted to better describe forest cover condition to the standard suite of regional forest units intended to not only describe forest cover type, but also to classify habitat and eco-type as well.

The Smooth Rock Falls Forest is mainly a black spruce forest. The available area in black spruce forest units has fluctuated from 225,000 hectares in the 1990-1995 period to 250,000 hectares in the 1995-2000 period to 230,000 hectares, (forest units SbClg, SpINT, SbHs), for the 2000-2005 period and finally to 247,639 ha in 2005 (forest units SP1, SB1 and SB3). The overall changes in available managed Crown productive forest can be attributed to conversion from the 1:15840 mylar-based inventory to 1:20000 digital inventory in 1992, which included conversion of B&S forest area (36,700 ha increase in the Sb working group alone), and reductions based on automatic stream buffering in the digital inventory. In addition, the OLL process removed 20,900 ha from the managed landbase during the implementation of the 2000 FMP.

4.1.6 Habitat for Species at Risk and Selected Wildlife Species

Data on the habitat for selected species is available from the 2000 and 2005 planning periods only. Table AR-12 provides a summary report of the selected wildlife habitat results taken from the 2005 FMP. The 2000 past figures were taken from the 2000 FMP. Overall the planning team deemed that the management strategy balanced the long term habitat supply of the species, particularly when compared to the defined bounds of natural variation that may occur over time. The 2005 FMP was written prior to the 2007 endangered species act. Of the species detailed in AR-12 only the woodland caribou is listed as Threatened. The habitat of this species is maintained between 2000 and 2005 and based on the current management strategy was projected to slowly decline between 2005 and 2105. A two-year contingency plan was developed for 2010-2012 period to allow the implementation of the Caribou Habitat regulation under the Endangered Species Act. At the time of preparation of this report the regulation had not been implemented however the planning team for the 2012 FMP has committed to implement the caribou habitat requirements detailed in the Caribou Conservation Plan, including the development and implementation of a dynamic caribou habitat schedule intended to provide for the habitat of woodland caribou for a period exceeding 100 years.

4.1.7 Monitoring and Assessment

Through the audit period there have been several significant economic events that require discussion. The primary occurrence has been the prolonged economic downturn that was initiated with the collapse of the U.S. housing market and spread internationally into a world-wide recession. This event has lead to significant curtailment of mill production, harvesting activities and associated silvicultural programs on the Smooth Rock Falls Forest. All major facilities that received wood from the forest had reduced production and/or halted production. As referenced earlier in this report, this economic reality has had a significant impact on the implementation of the 2005 FMP particularly with respect to harvest and renewal program target achievement. Associated with the recession has been the closure of the Smooth Rock Falls kraft mill in July, 2006, the Grant Forest Products OSB mill closure in Timmins in September 2006 and the periodic, but significant downtime that the Tembec sawmill in Cochrane has taken since 2007.

All of the insular and peninsular areas were planned for during the FMP planning process for the 2005 Forest Management Plan. For this reason, there were no additional operational NDPEG targets to be met during harvest. The insular and peninsular areas were mapped on the AWS maps and no harvest took place in these areas except for operational roads in a few blocks. When operational roads went through stands, the width of the right-of way was kept to a minimum. In addition to the landscape level planning, 25 stems per hectare were required to remain on site after harvest. This condition was met successfully.

The roads and water crossing monitoring program followed the Roads Strategy as outlined in the FMP. Washouts that were potential safety issues discovered during monitoring were flagged to address safety concerns

The use management strategies from the Forest Management Plan were adhered to. When operations occurred on a road, the road was maintained by either the Overlapping Licensee(s) or Tembec for harvest operations, or Tembec for silviculture operations.

The 2005 to 2008 annual reports summarize the annual compliance monitoring programs that have been implemented on the forest. The four AR's document a relatively well planned and executed program with no significant instances of non-compliance reported. All of the reported non-compliances were minor in nature with all instances resolved satisfactorily. The identification of significant trends proved to be difficult due to limited operations on the forest however the first year noted four minor trespasses outside the approved area. The final year ten AR will summarize all instances of non-compliance and report if this has developed into a trend or only a short-term concern.

There have been no exceptions monitoring activities during the implementation of the 2005 FMP.

Table AR-13 summarizes the assessment of regeneration and silvicultural success for the forest by forest unit and silvicultural ground rule. The annual FTG program on the SRFF contributes to meeting the 2005 FMP Objective II(3). This FMP objective is intended to keep forest ecosystems productive. The program reduces the amount of NSR on the forest by identifying areas that have sufficiently regenerated as well as identifying areas that require a treatment to reach FTG. In addition to FTG surveys the company continued its program of pre and post harvest careful logging surveys. Pre harvest surveys are used to determine where the careful logging prescription is appropriate for the site, and areas where another harvest method should be used (i.e. conventional harvest or group seed tree). These surveys contribute to meeting Objective II (4) to maintain the productivity of stands treated with careful logging and harvesting around regeneration potential (HARP). The survey identifies areas where there is in-sufficient advance growth to warrant a careful logging harvest method, or sites where careful logging may cause site disturbance by repeated traveling by machine in cut strips when the damage could be avoided by travelling over more of the site as in a conventional operation.

Post harvest careful logging surveys also help to meet Objective II (6). This objective is to employ cost effective renewal and tending treatments that will provide a perpetual and continuous flow of quality wood fibre from the forest. These surveys are used in identifying areas where it is felt that the careful logging treatment will not be sufficient to bring the area to the FTG standard in the timelines set in the silviculture ground rules. It also helps meet the tree plant targets associated with this objective.

For the HWD forest unit (poplar and white birch) 100% of the total area assessed during the 2005-2008 period was deemed successfully regenerated. Of the total area successfully regenerated 60% regenerated to the SGR projected forest unit while the remainder regenerated to other forest units. The practice of carefully logging around advanced conifer has lead to the naturally regenerated stands moving towards a more mixed wood condition than the original stand. In addition, the FRI appears to underestimate the conifer component of many of these sites and therefore the original species composition and resulting forest unit classification have been found to be inaccurate.

The LC1 forest unit assessments show that 27% of the total area assessed was found to be not successfully regenerated. Of the assessed area regenerated successfully 64% regenerated to the target forest unit.

The MWD FU represents the mixed conifer/hardwood condition. 6% of the total assessed area was deemed not satisfactorily regenerated with 57% of the successfully regenerated sites meeting the target FU condition.

The SB1 sites represent the intermediate moist slopes (transition up out of the lowland). These sites are expected to be maintained as spruce. While the majority of the surveyed sites were successfully regenerated (86 %) only 55% of the successfully regenerated sites actually remained as SB1. The remainder moved to SB3, SF1, LC1, SP1, and HWD. The movement to SB3 is a result of lower slope conditions within the transition zone. The movement to mixed spruce/fir/pine/poplar is largely attributed to the method of harvest, which tends to leave corridors of residual species, such as, balsam fir and aspen. This trend will continue as long as the harvest method and subsequent silviculture maintains other species.

The SB3 forest unit represents black spruce peatland sites. According to the survey results, 6% of the surveyed area was not successfully regenerated. Of the successfully regenerated sites 67% maintained the SB3 category. The remaining area moved to other forest units, such as SF1, MWD, SB1, SP1 and HWD. This is an indication that many of these blocks were stratified into more productive sites than the original inventory description. A slight increase in elevation promotes better drainage and more diverse forest units.

The SF1 forest unit is a spruce/fir forest unit often the result of past disturbance such as logging or spruce budworm infestation. Again, the trend is that the majority of these surveyed areas (i.e. 96%) are successfully regenerated however 61% of the successfully regenerated areas are not the projected forest unit. These sites are often targeted for artificial treatments moving them towards the pure conifer forest units such as SP1 and SB1. As well, poor FRI interpretation of this successional forest unit, combined with careful logging practices tends to move these sites towards a mixedwood condition when left to naturally regenerate.

Of the 6504 hectares surveyed in the four year period, approximately 10% was found to be not successfully regenerated. Of the successfully regenerated sites 61% of the sites regenerated to the projected forest unit in their respective silvicultural ground rule.

For the development of the 2010 contingency FMP, the Long Term Management Direction summary (Section 3.0) describes how actual forest regeneration results were considered during the development of sfmm inputs. The starting point for the SFMM post renewal succession rules were the NHF 2008 FMP inputs and the silvicultural effectiveness monitoring data available compiled by the MNR across the entire Abitibi River Forest. The post renewal succession rules also considered the actual silviculture program results for the Smooth Rock Falls Forest. An iterative review and adjustment process was followed to define the final post renewal succession rules. The post renewal succession was identical on the three claybelt forests (i.e. Iroquois Falls Forest, Smooth Rock Falls Forest and the Cochrane Moose River management unit) owing to similar species and forest unit composition of these forests (i.e. mainly lowland black spruce with limited upland conifer, hardwood or mixedwood forest units and very limited cedar, white birch, red and white pine, other hardwood, and jack pine species composition.

The key assumptions were:

extensive renewal was expected to increase hardwood species compositions based on the initial hardwood composition;
basic, intensive, and elite renewal was expected to increase the conifer component through planting in most cases;
if there was a spray it was expected to reduce or eliminate the hardwood composition and increase the conifer composition
all renewal was expected to maintain the regeneration treatment intensity, except for failures where hardwood or mixedwoods were expected to be extensive, extensiveW or basic1; and,

the Bw1 and Mwd basic yield intensities were created through increased conifer composition through planting failures or planted areas not sprayed;
the extensiveW yield intensity and post renewal was designed to reflect increased hardwood regeneration and composition resulting from winter harvesting of the Po1, Po3, Mwd, and Bw1 forest units which provides nutrient loaded root systems for spring suckering.

For the development of the 2012 Forest Management Plan for the Abitibi River Forest, the planning team will be required to review all of the MNR's silvicultural effectiveness monitoring data as in combination with the SFL manager's silvicultural survey results and integrate this data into the post renewal forest succession inputs with associated yield curve adjustments. This will ensure that the future forest model outputs best reflect the expected outcomes of the various silvicultural treatments utilized on the forest.

4.2 Analysis of Forest Disturbances

The year ten Annual Report completed for the 2000-2005 planning period documents the results of the planned and actual forest disturbance implementation and provides a summary of the actual clearcut sizes that were implemented during the 2000-05 period.

The 2000-05 FMP harvest blocks were not organized into planned clearcuts or disturbances so it made it difficult to compare planned versus actual results for each clearcut. The 2000-05 actual disturbances were assessed by taking the actual clearcuts and buffering in and out by 200 metres to define the residual forest and harvested area within each disturbance patch. For the period several large clearcuts were not completed which increased the relative frequency of smaller disturbances and in 6 out of 8 classes where disturbances were forecast to move away from the template the actual resulted showed even greater movement away from the template. For two of the larger size classes (521-1040 and 2501-5000 ha) the achievement was moving towards the template levels

For the development of the 2010 contingency FMP, the landscape indicators were developed for the entire Abitibi River Forest and not assessed to the sub-management unit level therefore an analysis of harvest and natural disturbances for the Smooth Rock Falls Forest was not produced. In order to properly assess the objective achievement for the landscape level indicators for the 2005-2010 period, all harvest and renewal activities for the plan period must be complete. Partial harvesting in ongoing harvest operations combined with incomplete harvesting data of blocks within a disturbance area significantly alters the results of this analysis and attempting to analyze trends from four years of data would render inaccurate assessments of actual against planned. A complete assessment will be provided in the final year-ten annual report for the 2005-2010 FMP however based on the total harvest area depleted to date, it is not anticipated that significant difference from the 2000-2005 findings will be realized..

For the 2012 FMP for the Abitibi River Forest the implementation of NDPEG will be replaced by the direction in the draft Landscape Guide (science package results) for the forest. The BFOLDS outputs will provide the target achievement ranges for landscape level indicators. In addition, a significant strategic shift in landscape level planning will be implemented with the application of the woodland caribou conservation plan requirements for the forest. The application of a Dynamic Caribou Habitat Schedule will result in the development of relatively large landscape patches designed to enhance long term caribou habitat, rather than to specifically meet natural disturbance template size class targets.

4.3 Analysis of Renewal and Tending Activities

Refer to Section 4.1.3, 4.14 and 4.1.7 for an analysis and discussion of the trends in renewal and tending. After four years the total renewal expenditures of $2,140,610 is 64% of the planned expenditure of $3,362,000 (i.e. 80% of FMP27 values). As described previously, this reduced achievement can be attributed primarily to reduced harvesting activity for the period to date.

Based on the information in Section 4.1.3, 4.14 and 4.1.7 the following recommended changes to renewal and tending need to be considered:

- More timely assessment of naturally regenerating areas scheduled annually
- Additional refinement of planned natural verses artificial treatments need to be explored.
- Refinement of planned chemical SIP levels should occur in future FMP's
- Careful evaluation of post-renewal successional pathways based on monitoring data needs to be completed and included in future forest modeling inputs.

4.4 Review of Assumptions in Modelling

Table AR-7 provides a summary of planned vs. actual harvest area and AR-9 provides the summary of planned vs. actual for renewal. To date only 26% of the total AHA has been harvested representing approximately 1 ¼ years of equivalent harvest. The renewal program as a result has been scaling down since 2005. Based on the limited sample it is difficult, and perhaps misleading to attempt to draw trends from the limited data when reviewing modelling assumptions from the 2005 FMP.

The 2010 contingency forest management plan for the amalgamated Abitibi River Forest reviewed and modified assumptions in the modelling for the development of the LTMD (see Section 3.0, pg 2). The review included an analysis of the existing forest units for the four amalgamated management units and the subsequent development of updated forest units. The data presented in this trend analysis does not provide any evidence that the new forest units are inappropriate or warrant modification. An issue that is not uncommon on forests is the continuous modification and refinement of forest units. This trend has made the comparison between planning periods difficult and often negates the opportunity for the forest manager to extract trends from the data. With the amalgamation of four former management units into on forest and the application of one set of forest units across a larger area, the issue of forest unit comparisons between planning periods should lessen in the future.

A review of the modelling assumptions from the 2000-2005 FMP was completed in the yr-10 annual report. The discussion included the modifications made for the 2005 FMP. The following are sections from the yr-10 report with additional analysis included where the data for the first four years of plan implementation allowed.

Several assumptions were made for inputs into the SFMM for the 2000-2020 FMP in order to produce the selected management alternative. These assumptions are related to forest dynamics and development information, natural depletions, and silvicultural funding levels. Some of the assumptions used will be reviewed and their validity examined.

Several assumptions regarding forest dynamics and forest development were made. Forest growth is projected based on a set of yield curves. In order to determine allowable harvest levels, product definitions and proportion of yields need to be set. In addition, operability limits have to be considered. In the 2000 FMP, projection of forest growth and yield was done using the Northeast Regional pure species yield curves. These curves were developed for use in the whole Northeast Region. The pure curves were transmuted to yield curves for each Forest Unit. However, the majority of the forest is in the Northern Clay Belt. Forest yield should be expected to develop, on average, differently on the fine textured and extensive organic soils of the Smooth Rock Falls Forest. The SFMM for the 2005 FMP used Penner yield curves that were localized for clay belt forests. Although the Penner yield curves are more statistically robust than the Northeast Regional yield curves, there is room for increased confidence in predicted yields for mixed condition forest cover types. Support for the continued refinement of the Penner curves should be sustained. The 2012 FMP planning team will continue to refine the yield curves based on actual harvest volume data and updated yield information from MNR.

Seedling requirements and future species composition of intensive stands

Within the 2000-2005 FMP, documentation suggests that white spruce was to make up 20% of the one million seedling annual planting programs. It was further assumed that no jack pine would be planted despite the planned harvest of several jack pine stands. The management mindset that developed this seedling mix followed through to the SFMM assumptions regarding future species composition in basic and intensively regenerated stands. For example, intensive (plantations) of the MixCo forest unit were forecast to have only a 5% jack pine component and intensive SpUPL (the white spruce forest unit) would have only an increase from 30% to 40% white spruce component. Total trees planted from 2000 to 2005 were 5,696.3 million seedlings. Actual planting proportions were 5% jack pine, 43% white spruce, and 52% black spruce. On suitable sites both jack pine and white spruce have superior yield characteristics that could contribute favorably to future fibre supply from this forest. Future SFMM assumptions in this regard should examine past planting regimes and the regeneration results being achieved to determine a more aggressive species composition for intensively treated sites, particularly upland conifer sites. From the 2005-2010 period to date 7% of the seedlings planted were Pj, 26% Sw and 67% were Sb.

Regeneration intensity constraints

Several minimum and maximum regeneration proportions were set in the modeling. Table 3a shows the proportions.

Table 3a: SFMM Constraints on Regeneration Proportions by Intensity for Term 1.

Forest Unit	Extensive	Basic	Intensive
SbCLG		Min 10%	Min 5%
SbHs		Min 10%	Min 5%
MixCo		Min 30%	
SpINT	Min 40%	Max 40%	Max 60%
MxWd	Max 70%		Max 40%
SpUPL	Max 60%		Max 60%
PoMix		Max 40%	
BwPMX		Max 40%	

Table 3b: Actual Regeneration Proportions by Intensity for Term 1

Forest Unit	Extensive	Basic	Intensive

SbCLG		10%	30%
SbHs		5%	40%
MixCo		10%	70%
SpINT	25%	35%	40%
MxWd	30%		70%
SpUPL	5%		80%
PoMix		0%	60%
BwPMX		35%	40%

Actual intensity proportions were affected during the 2000-2005 term by nearness to all weather roads. Due to only 50% of the planned harvest occurring, nearness to roads tended to increase the treatment intensity. Normally proportions of SbCLG and SbHs forest units treated intensively would be similar to the constraints of 5% established in the SFMM. Comparison of Tables 3a and 3b show a striking difference between the maximum constraints for the MxWd and SpUPL forest units. Both were treated in actuality more intensively than the constraints of the SFMM. The Smooth Rock Falls Forest is currently not meeting the established volume targets for conifer supply. Establishment of maximums for intensive silviculture treatments for the most productive conifer sites (MixCo, SpUPL, SpINT, and MxWd) appears counter intuitive. The validity of using maximum levels for intensive treatments should be carefully examined to avoid inhibiting fibre supply in the SFMM.

Silviculture costing and post renewal succession

Seedling requirements and renewal costs by forest unit were set for each permitted option within the SFMM. The PoPur forest unit as an example had no cost for intensive management, as it was not a desired treatment. All extensive treatments were assumed free. This assumption assumed that there was no cost to assess harvest success, no regeneration survey cost, and no likelihood of supplemental treatments. Modeled cost for all intensities should include the potential for additional treatments based on actual results. The number of seedlings used for each intensity contributed to the treatment cost. However, for every intensive treatment 1,800 seedlings was used to calculate this cost. Achieved average planting density over the five years of the 2000-2005 term was 1,575 seedlings per hectare. Standard practice of careful logging all sites, including those destined to be planted, and snag tree retention contributed to this lower than modeled density. The recent IFA suggests that careful logging not be applied on sites that are intended for intensive renewal in order to help maximize site potential. The seedling density targets used in SFMM should be reviewed to ensure they more accurately reflect the actual anticipated cost of silviculture treatments. This recommendation will be reexamined during the development of the LTMD for the 2012 FMP for the Abitibi River Forest.

Post renewal succession was formulated using professional judgment and past silviculture activities as reported in annual reports. For example, the proportion of upland spruce treated by site preparation, planting, and tending was used to determine the amount of the SpUPL forest unit that would move either to MixCo (30%), MxWd (20%), SpINT (10%), or remain SpUPL (40%). These proportions were based on planted species and the anticipated success of tending treatments. Actual free-growing success rates of renewal to the projected forest units should be used. This data was not available in sufficient quantities to allow a robust calculation of post renewal transitions for the 2000-2005 FMP. A much larger amount of data was available for the 2005-2010 FMP and was used in this manner but still incorporated professional judgment relating to recent changes of management strategy that cannot be captured from data of past practices. Assumptions regarding post harvest succession will always be subject to adaptation of management strategy. The most recent historic data, including the information shown in AR-13 and discussed in section 4.1.7 will be combined with similar data from the three other amalgamated forests, filtered through professional judgment and utilized in the 2012 FMP.

Riparian reserves and bypass

In the 2000-2005 FMP, approximations, based on a limited sample, were made to estimate percentages of the landbase, for both accumulating riparian and interior reserve area. These approximations were supported by a spatial exercise that buffered lakes and rivers within the forest by 30 metres. The productive forest within these buffers was summarized by forest unit and age class and reserved from harvest within SFMM. This area totaled slightly more that 6% of the productive forest landbase. This 30 metre riparian area was not coded into the planning inventory however. The accumulating reserves within SFMM were split between two types, Riparian and Habitat. Riparian reserves were assumed to be for other waterway reserves such as canoe routes (120m) or wider fisheries protection (50m) and averaged between 2% and 4% depending on forest unit. Habitat reserves were assumed to be for other reserves such as stick-nest reserves and moose aquatics and were set at 3% for all forest units.

The area projected to be reserved for each forest unit was reported in Table FMP-19 for the 2000 FMP. The area projected in Table FMP-19 corresponds to the addition riparian area only. Therefore, when the actual planned reserve area associated with harvest allocations was included in Table FMP-19 the planned area appeared unusually large compared to the projected area because it included all of the area in the riparian reserves not just the accumulating portion plus all moose aquatics and stick-nests. Simply stated, the Table FMP-19 from the 2000-2005 FMP was completed incorrectly.

The FMP text identified this discrepancy and provided rationale that the increased reserve area was additional protection of values related to the Taykwa Tagamou Nation that occurred late in plan preparation. These reserves did increase the reserve area due to being measured from standing timber instead of from water's edge.

The value in Table FMP-19 that corresponds to 2% accumulating reserve is 620 ha this would mean that 3% would be 930 ha and 6% would be 1860 ha. Therefore, 2% riparian plus 3% habitat plus 6% reserved in the model would be 620 + 930 + 1860 = 3410 ha approximately. The area in hectares is reported as planned in Table FMP-19 was 2269 ha or 67% of the projected amount. Therefore, riparian area was over estimated in the SFMM for 2000-2005 by 3.5% on average.

No bypass was modeled in the 2000-2005 FMP. An average value of 4% based on the first three years of harvest was derived for use in the 2005-2010 plan. The over estimate of reserve area was compensated for inadvertently by not including bypass.

For the 2010 contingency FMP estimated reserves were identified in a coverage so that they could be netted out of the available forest manually. The estimated reserves were not depicted within the base model inventory. Estimated reserves were defined by overlaying the values data onto the base model inventory and applying the known reserve prescriptions for the values. The 2012 planning team will review and revise estimates of areas reserved from harvesting for the amalgamated FMP and accommodate foreseeable values protection as appropriate.

Roads and Landings

For the 2000-2005 FMP loss of productive land to roads and landings as a result of forest operations was assumed to be two percent for each forest unit. This assumption was an attempt to address a data gap in strategic modeling. The loss was modeled to occur for the first eight ten year terms because the desired future forest condition was to be achieved in 2085. Furthermore, after eighty years the forest would be completely accessed.

Supplemental aerial photography from the first three years of harvest depletion of the 2000-2005 FMP was assessed and revealed varying amounts of roads and landings by forest unit. Upland forest units tended to have higher portions of road building. Lowland conifer forest units had approximately 1% lost to roads and landings while upland conifer areas having

3% lost area. Mixedwood and hardwood stands fell in the middle with 2%. These findings were incorporated into the 2005-2010 FMP.

What is not clear from the documentation of the 2000-2005 FMP is whether slash management activities were included in the estimation of area lost to roads and landings. In preparation for the 2010-2020 FMP actual area lost to roads, landings, and slash accumulation should be calculated from supplemental aerial photography. This actual data should be used to better estimate this particular metric. Review of the potential natural rehabilitation of slash piles should also be examined as a result and may require an assumption be made at that time. The Analysis Package for the 2010 FMP details the process utilized for determining the conversion of harvested area to non-forest.

Natural rehabilitation of barren and scattered

In the 2000-2005 FMP, relatively low natural rehabilitation rates were used to estimate the area returning to the productive forest. The rates ranged from 3.33% to 10%. This resulted in 17,704 hectares returning to the productive landbase from a total of 42,645 hectares, or 40%. Given the active assessment of backlog area (section 2.10.3) this was if anything a conservative estimate.

For the 2005-2010 FMP, the natural rehabilitation rates were estimated based on an extensive survey program carried out in the late 1990's through to the early 2000's. The survey program resulted in a large number of hectares returning to the productive landbase. The survey program also provided a very good database to assist in determining natural rehabilitation of the barren and scattered classified areas. The rates ranged from 5 % to 10%. This resulted in 5,902 hectares returning to the productive landbase from a total of 7,449 hectares, or 80%. The 2010 planning team incorporated a different approach by assuming that there would be no active or natural rehabilitation of the current B&S area, thereby maintaining this area across the landbase in perpetuity. The 2012 planning team will review this approach as part of the development of a new LTMD.

Natural succession of forest units

The natural succession assumptions used in the 2000-2005 FMP were based on the best information of the day, refined by the expert opinion of Company and the MNR staff. The successional pathways were based upon the forest units of the day. Some feathering was incorporated, thereby ensuring that the transition was done over a number of 10-year terms.

These natural succession inputs were further refined for the 2005-2010 FMP, with the assistance of the Regional MNR Staff. Their review comments were incorporated within the new model. In many cases more feathering was applied to the transition.

In addition to the utilization of Regional Standard Forest Units, the new natural succession matrix incorporated an additional silvicultural intensity to address the mixedwood and hardwood stands affected by the forest tent caterpillar (aspen decline). The 2010 planning team utilized the Northeast Regional Standard Forest Units Version 2(NESI Technical Note TN-020) and professional opinion as the basis for the succession rules.

Fire return cycles natural and post suppression

In both the 2000-2005 and 2005-2010 FMP's, pre-suppression fire return cycles were determined using the best available information of the day. Fire cycles for the 2000-2005 FMP were generally younger then the pre-suppression rates used for the 2005-2010 FMP.

In 2000-2005, the pre-suppression ages ranged from 70 years (Mixed Conifer) to 120 years (Mixedwood and Lowland Conifer site types). The 2005-2010 FMP used rates that ranged from 80 years (Jack Pine) to 143 years (Lowland Conifer site types).

In both the 2000-2005 and 2005-2010 FMP's, post-suppression fire return cycles were again determined using the best available information of the day. Fire cycles for the 2000-2005 FMP were on average very similar to the post-suppression rates used for the 2005-2010 FMP.

In 2000-2005, the post-suppression ages ranged from 2,091 years (Mixed Conifer and Spruce Upland) to 3,291 years (Hardwood site types). These disturbance cycles resulted 103 hectares per year of natural disturbance. The 2005-2010 FMP used rates, which ranged from 2,500 years (All Upland Sites including SB1) to 4,000 years (Lowland Conifer site types). These disturbance cycles resulted 110 hectares per year of natural disturbance.

For the 2010 FMP the planning team utilized research by the lake Abitibi Model Forest as per Regional direction and is well documented in the analysis package. The 2012 planning team will utilize data from the Landscape Guide science package in the determination of fire return cycles, which in turn will contribute to the development of the dynamic caribou habitat schedule.

Renewal

Section 4.1.3 provides an analysis of the renewal and maintenance activities for the period. The underachievements of renewal targets are the result of short harvest reductions and therefore do not represent a long-term trend. Survey work will be undertaken in 2010 to review the regeneration of recent harvest areas and an implementation plan will be developed to schedule any outstanding silvicultural treatments.

Table AR-13 has shown some preliminary indications that the actual achievement of the projected forest unit through the application of a specific silvicultural ground rule and modeled via the post renewal forest succession inputs requires refinement. Although the total area regenerated by Forest Unit is acceptable, the future forest units being created by the treatments do not appear to be meeting projections. Refinements to the SGR projections were made for the 2010 contingency plan however, for the development of the 2012 FMP it is recommended that all current silvicultural effectiveness monitoring data be re-analyzed to ensure that future forest unit projections reflect the survey data.

4.5 Assessment of Objective Achievement

Table AR-14 provides an assessment of objective achievement for the 2005 FMP. Many of the objectives are developed and assessed during the development of an FMP.

Forest Diversity Group

The Forest Diversity Group objectives are measurements of area (hectares) of various forest cover classifications. The Forest Unit Area objective measures the area within each Forest Unit to ensure that the forest cover type falls within the bounds of natural variation. This assessment is completed during the development of the FMP, which in 2005 concluded that all forest units are within the bounds. All management alternatives had 10 acceptable terms and were within plus or minus 50% of the natural run for all terms and met the objective. For the age class structure objectives the indicator is the proportion of the area within each forest unit group. For the mature objective the target was to maintain greater than 15% of the cover type area in an over mature state. For the overmature objective the target was to maintain greater than 5% of the cover type area in an over mature state. The objectives were met as since all management alternatives me the target for greater than 10 terms.

Social and Economic Group

Wood supply targets were set for SPF and for Poplar, Poplar veneer, White birch and White birch veneer. In addition, wood flow targets were assessed to ensure that volume did not fluctuate more than 10% between terms.

For SPF, none of the management alternatives modelled during plan production were able to achieve the target of >311,000 m3/yr. However, the selected management alternative was able to maintain wood flow within 10% for 10 terms.

For Poplar, the selected management alternative was able to meet the target volume of 7600 m3/yr but was not able to maintain this volume within 10% through ten terms. For Poplar veneer the volume target was met for 8 of 10 terms however the woodflow objective was not assessed during plan production.

White birch wood supply targets of 3,300 m3/yr were not achieved for any management alternative and only marginal success was achieved with the selected management alternative in maintaining a relatively constant wood flow between terms. The same results held for the production of birch veneer

For the 2005-2010 period only 20% of the planned harvest volume has been utilized. Based on expected outcomes from the 2009-2010 annual report it is unlikely that this assessment will change significantly. This volume figure relates well to the 26% of the allocated harvest area actually harvested during the period.

The under-harvest is apparent across all of the forest units and can be attributed to poor markets for softwood lumber, pulp and paper, oriented strand board and hardwood plywood as a result of the recent global economic recession spurred by the collapse of the housing market in the United States and to a lesser extent Canada. Contributing to this was the countervailing duty applied to softwood lumber as well as the increase in the value of the Canadian dollar against the American currency making exports to the United States less attractive. In addition, high fuel and electricity costs and insurance premiums all conspired to increase production costs at a time when prices for forest products were in steep decline. Finally, in an attempt to minimize operational costs, some companies focused on sourcing fibre as close to the mill as possible in order to reduce haul costs thereby leaving more distant areas unharvested. Throughout this period the facilities in Cochrane, Timmins and Englehart as well as smaller mills all took operational downtime due to the lack of markets for their products. In addition the Tembec Industries kraft mill was closed permanently on July 31, 2006. While the final 2009-2010 annual report information had not been compiled at the time this trend analysis was completed is likely that this trend will persist through to the end of the five-year term.

Forest Cover Objective Group

The objective for habitat levels for the indicator species is to maintain the total habitat area within the bounds of natural variation. An initial assessment was completed during the development of the 2005 FMP and all habitat levels were within the bounds. After four years of plan implementation, there are no discernable trends to be drawn for this objective achievement.

Silviculture Objective Group

An objective for the 2005 FMP was to ensure that the total revenues were sufficient to meet expected revenues. This objective was met during plan production and after four years of implementation the revenues in the FRTF continue to exceed the minimum balance.

None of the modelled management alternatives was able to meet the objective of maintaining the available productive forest area for 10 terms due to reductions in the landbase for reserves, roads and landings.

For total forest area, the desired future forest condition for the selected management alternative has been met with no significant reductions over time.

All planned renewal operations were not carried out during the 2005-2008 period. The underachievement of planned level can be attributed to the economic downturn and the resulting reduction in harvested area as described above.

Forest Diversity Indicators of Sustainability

The Shannon Weiner Index of Landscape Heterogeneity, Simpsons Index of Landscape Heterogeneity and the Shannon Index of Landscape Evenness all have generated values within the bounds of natural variation.

Multiple Benefits to Society Indicators of Sustainability

A 2005 objective was to maintain the total managed Crown forest available for timber production within the defined bounds of natural variation. The selected management alternative was able to accomplish this for all forest units for 10 terms except for the SF1 FU. The planning team agreed that this variation from the bounds for the one forest unit was an acceptable trade-off when assessing the benefits derived from the selected management alternative.

A management objective was developed to ensure that the total AHA was available to be utilized. This objective was met with 100% of the AHA by forest unit remaining available for harvest.

Non-Quantifiable Objectives

Table AR-14 also assessed the achievement of the non-quantifiable objectives developed during the 2005 FMP.

Marten habitat was addresses through an objective of maintaining Marten core areas across the forest. During plan development the objective was achieved when core areas were developed and defined spatially and deferred from the productive land base in SFMM for 60 years.

The genetic conservation of the forest was addressed through an objective of following the MNR's seed zone policy and maintaining a seed bank for forest renewal. As well, retention areas, natural regeneration treatments and careful logging all contribute to meeting this objective.

A natural disturbance pattern emulation objective was included in the FMP and was achieved by applying the NDPE Guide requirements both strategically during plan development and operationally during plan implementation.

An objective to minimize adverse effects of forest management activities on water quality and aquatic habitat was included in the 2005 FMP. This objective was met via the application of MNR guidelines during plan production through to operational implementation.

The planning team developed an objective intended to protect the forest from sustained deforestation or conversion to other uses. With respect to deforestation, the strategy was to conduct annual surveys to assess the regeneration needs of harvested sites and to apply appropriate silvicultural packages to ensure successful regeneration.

The final non-quantifiable objective is the socio-economic activity levels generated from the forest management activities on the Smooth Rock Forest. A qualitative assessment was made that, based on the economic activities generated in the forest, benefits would accrue to the local, regional and provincial economies. As detailed in this report the reality of the recession has caused a curtailment of activities and the economic benefits have not been generated from the forest at anticipated levels.

4.6 Determination of Sustainability

As discussed in Section 4.5 most of the objective achievements are within, or moving towards the desirable levels for the indicators. All forest diversity objectives are within target ranges.

The socio-economic indicators for wood supply achievement have been assessed after four years and are not at the desirable levels. Section 4.1.1 and 4.1.2 clearly demonstrate an underachievement of harvest area and volume for the first four years of plan implementation. The factors that have contributed to this under achievement originate from an economic recession that has extended across all world economies, but particularly the United States which is our primary trading partner for forest products. As the economic cycle changes and the economy recovers it is anticipated that demand for forest products will return. The long-term trend for forest product demand is predicted to continually increase so the recent downturn should have no long-term implications on future volume production or economic sustainability.

Renewal operations for the forest have been consistent with harvest levels. Earlier planned estimates for natural regeneration were inconsistent however a longer term trend developed showing that approximately 2/3 of the area harvested on the forest are appropriate for natural regeneration treatments. Increased reliance on natural regeneration was forecasted for the 2005 FMP however there has not been enough survey work completed yet to confirm this estimate. Artificial treatments, particularly tree planting have been maintained at acceptable levels through the trend analysis period. Mechanical site preparation treatments have reduced over time in an effort to maintain advanced regeneration and to direct plant on chemically site prepared areas. Finally, aerial tending levels have consistently been appropriate across the trend analysis period with little variation due to changes in economic conditions.

All forest diversity indicators of sustainability are at acceptable target levels over time. The wood supply utilization, while deemed sustainable in the 2005 FMP has fallen short of planned levels for the first four years (as described in section 4.1.1 and 4.1.2) however the rationale for this underachievement is due to the economic conditions that are described above. The total managed Crown forest available for timber production has been maintained for the planning period as well.

An updated status report of the implementation of 2005 recommendations was approved in June, 2009. The report detailed the progress in addressing each of the recommendation assigned to either Tembec Industries or to the MNR. The majority of actions required to address the 26 audit recommendations have been completed or have started and are classified as ongoing. Only two of the 59 action statements developed to address the 26 recommendations are not started and have not been started and remain unaddressed.

Recommendation No 5:

"The **MINISTRY OF NATURAL RESOURCES** must provide adequate funding to conduct necessary non-timber values surveys to ensure values in areas of proposed forest management activities are incorporated into planning and adequately protected."

Action statement 5.4 stated that the MNR Cochrane District will formulate a prioritized strategy that will provide non-timber values information including focusing on other means of acquiring the required data to support the FMP objectives and strategies, efficiencies and creative ways of accomplishing what is needed. No formalized strategy has been created. MNR intends to rely on the existing procedures to prioritize values collection work in the district between all of the forests depending on annual pressures.

Recommendation No. 13

"TEMBEC and The **MINISTRY OF NATURAL RESOURCES** must closely monitor compliance to utilization standards set out in the scaling manual."

Action statement 13.5 stated that Tembec /MNR Compliance Inspectors to jointly develop utilization benchmarks (calibration) to measure continuous improvement and performance. A basic utilization database will be jointly developed to assist with performance evaluation. This will not be completed during the 2005-2010 period as the drastically reduced total level of harvest has precluded the parties from developing utilization benchmarks.

Conclusion

Based on the level of objective achievement as described above and the current status of the 2005 independent forest audit action plan, it is concluded that the implementation of planned operations has provided for the long-term sustainability of the Crown forest.

Appendices

MANAGEMENT UNIT NAME: Smooth Rock Falls

PLAN PERIOD: 2005 To 2010
ANNUAL REPORT: 2009 To 2010

AR-7: Summary of Planned and Actual Harvest Area

Forest Unit			Area (ha) - Annualized													
			PLANNED HARVEST			ACTUAL HARVEST										
			Past Plans			Past Plans						Current Plan				
												2005-2010			Projections	
1990-2000	2000-2005	2005-2010	1990-1995	1995-2000	2000-2005	*1990-1995		*1995-2000		**2000-2005		Planned Harvest	***Actual Harvest		Medium-Term 2025	Long-Term 2105
						Harvest	Natural	Harvest	Natural	Harvest	Natural		Harvest	Natural		
Spruce 1	SbINT, SpUPL	HWD	2,827.0	3,174.0	791.0	2,227.4		2,579.0	135.0	424.0		59.9	41.9		52.0	35.0
Spruce 2	SbCLG ,SbHs	LC1	297.0	224.0	2,282.0	145.6		137.0	34.0	927.34		123.6	42.0		88.9	88.0
Spruce 4		MWD				22.6				-		235.4	95.6		204.4	174.6
Jack Pine	MixCo	PJ1	3.0	12.0	66.0	-		8.0	-	36.6		6.8	7.9		3.8	6.2
Poplar	PoPur, PoMix, MxWd	SF1	73.0	473.0	307.0	9.2		441.0	36.0	232.72		124.8	28.0		238.9	450.2
White Birch	BwPMX	SP1	5.0	90.0	11.0	1.8		50.0	1.0	9.66		241.5	61.9		163.4	122.5
OC	Ocon	SB1		10.0	9.0	-		16.0		7.04		573.7	126.9		628.3	862.3
Balsam Fir		SB3		37.0		-		15.0	3.0			1,581.2	369.9		1,015.8	1,247.7
Total			3,205.0	4,020.0	3,466.0	2,406.6	-	3,246.0	209.0	1,637.4	-	2,946.9	774.0	-	2,395.5	2,986.4

*Data sourced from 2005 SRF Trend Analysis
**Data sourced from AR

***Data includes 05-06 to 08-09

MANAGEMENT UNIT NAME: Smooth Rock Falls

PLAN PERIOD: 2005 To 2010

ANNUAL REPORT: 2009 To 2010

AR-8: Summary of Planned and Actual Harvest Volume

	Volume (m^3) - Annualized									
	PLANNED HARVEST VOLUME			ACTUAL HARVEST VOLUME						
	Past Plans			Past Plans			Current Plan			
							2005-2010		Projections	
Species	*1990-1995	*1995-2000	**2000-2005	*1990-1995	*1995-2000	**2000-2005	Planned Harvest	***Actual Harvest	Medium-Term 2025	Long-Term 2105
White Pine	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.3	-	-
Jack Pine	319.0	1,559.0	289.0	670.8	1,534.0	89.0	1,994.7	885.6	1,924.0	1,343.9
Spruce	307,207.0	276,000.0	234,747.0	186,957.6	290,552.0	129,083.0	178,330.7	38,190.4	180,377.4	227,318.2
Balsam Fir	4,104.0	9,031.0	24,966.0	8,446.0	11,636.0	3,312.0	3,825.6	3,286.3	4,698.7	6,337.9
Other Conifer	4,970.0	3,274.0	7,147.0	34.8	-	254.0	5,976.1	454.3	6,855.9	9,544.9
Aspen	18,456.0	35,812.0	26,574.0	2,419.6	43,553.0	14,309.0	22,271.4	112.8	27,276.0	20,048.3
White Birch	3,058.0	6,696.0	3,162.0	-	28.0	148.0	1,538.3	644.3	2,025.3	1,921.8
Other Hardwood	-	-	-	444.0			-			
Total	338,114.0	332,372.0	296,885.0	198,972.8	347,303.0	147,195.0	213,936.7	43,574.0	223,157.3	266,515.0

* Data sourced from 2005 Trend Analysis

** Data sourced from AR

***Data includes 05-06 to 08-09

MANAGEMENT UNIT NAME: Smooth Rock Falls
PLAN PERIOD: 2005 To 2010
ANNUAL REPORT: 2009 To 2010

AR-9: Summary of Planned and Actual Renewal, Tending and Protection Operations

	Area (ha) - Annualized							
	PLANNED			ACTUAL			PLANNED	ACTUAL
	Past Plans			Past Plans			Current Plan	Current Plan
Operation	1990-1995	1995-2000	2000-2005	1990-1995	1995-2000	2000-2005	2005-2010	2005-2010
Renewal								
Natural Regeneration								
Clearcut Silvicultural System (even-aged)	1,882.4	2,934.4	2,488.4	153.2	1,897.6	1,109.8	2,860.6	494.9
Shelterwood Silvicultural System (even-aged)	-	-	-	-	-	-	-	-
Selection Silvicultural System - Selection Harvest (uneven-aged)	-	-	-	-	-	-	-	-
Artificial Regeneration	-	-	-	-	-	-	-	-
Planting	707.2	844.2	976.2	635.8	490.6	678.0	823.0	448.0
Seeding	260.0	241.0	-	88.0	-	126.0	-	110.4
Scarification	-	-	-	-	-	-	-	-
Total Renewal	2,849.6	4,019.6	3,464.6	877.0	2,388.2	1,913.8	3,683.6	1,053.3
Site Preparation (mechanical, chemical, prescribed burn)	-	-	-	-	-	-	-	-
Mechanical	780.0	729.0	215.0	521.4	59.0	122.0	187.5	46.7
Chemical	350.0	-	-	-	-	50.4	-	131.2
Prescribed Burn	100.0	-	-	-	-	38.6	116.5	19.5
Total Site Preparation	1,230.0	729.0	215.0	521.4	59.0	211.0	304.0	197.3
Tending	-	-	-	-	-	-	-	-
Cleaning	910.0	844.2	944.0	793.6	1,135.2	792.8	1,396.8	1,325.1
Spacing, Pre-Commercial Thinning, Improvement Cutting	-	-	-	-	-	-	-	-
Clearcut and Shelterwood Silvicultural Systems (even-aged)	-	-	-	-	-	-	-	-
Selection Silvicultural System (uneven-aged)	-	-	-	-	-	-	-	-
Total Tending	910.0	844.2	944.0	793.6	1,135.2	792.8	1,396.8	1,325.1
Protection (Insect Pest Control)								

MANAGEMENT UNIT NAME: Smooth Rock Falls

PLAN PERIOD: 2005 To 2010

ANNUAL REPORT: 2009 To 2010

AR-10: Summary of Harvest and Regeneration Trends

		Term			
Forest Unit		*1990-1995	*1995-2000	*2000-2005	**2005-2010
All FU's	Harvest/Salvage (ha)	14,657.0	19,560.0	10,623.0	3,096.0
	Surveyed (ha)	11,599.0	n/a	n/a	n/a
	Regenerated (ha)	13,055.0	9811	92	n/a
	Unavailable for Regeneration (ha)	n/a	n/a	n/a	n/a
	Un-surveyed (ha)	n/a	n/a	n/a	n/a
	Percent FU Successfully Regenerated	89.1%	50.2%	0.9%	n/a

Source: *GIS coverages
** 2005-2008 AR

MANAGEMENT UNIT NAME: Smooth Rock Falls

PLAN PERIOD: 2005 To 2010

ANNUAL REPORT: 2009 To 2010

AR-11: Summary of Forest Condition for the Available Managed Crown Productive Forest

Forest Unit	Age/Condition Class	Area (ha)									
		Past Plans						Current Plan 2005-2010			
		1990-1995		1995-2000		2000-2005		Plan Start 2005	Plan End 2010	Projections	
		Protection	Production	Protection	Production	Protection	Production			Medium-Term 2025	Long-Term 2105
1990 and 1995 FMP Forest Units											
Spruce	1-20				16,726						
	21-40		3,250		28,616						
	41-60		15,612		24,774						
	61-80		29,523		11,560						
	81-100		26,054		34,270						
	101-120		61,045		23,789						
	121-140		90,342		71,749						
	141-160				46,246						
	161-180				4,449						
	181-200				336						
	200+				11						
Forest Unit Subtotal		21,045	225,826	20,244	262,526						

Poplar	1-20		74		1,787						
	21-40		2,971		888						
	41-60		3,996		3,609						
	61-80		5,620		4,755						
	81-100		2,624		4,502						
	101-120		2,296		2,105						
	121-140		35		1,598						
	141-160				26						
	161-180				5						
	181-200										
	200+										
Forest Unit Subtotal			17,616	44	19,275						
Jack Pine	1-20				161						
	21-40		104		27						
	41-60		302		152						
	61-80		94		179						
	81-100		58		91						
	101-120		62		48						
	121-140				167						
	141-160										
	161-180										
	181-200										
	200+										
Forest Unit Subtotal			620		825						

Red Pine	1-20										
	21-40										
	41-60										
	61-80										
	81-100										
	101-120										
	121-140		24								
	141-160										
	161-180				24						
	181-200										
	200+										
Forest Unit Subtotal			24		24						
White Birch	1-20										
	21-40		1,001		760						
	41-60		1,463		1,198						
	61-80		211		1,308						
	81-100		70		229						
	101-120		79		36						
	121-140				77						
	141-160										
	161-180										
	181-200										
	200+										
Forest Unit Subtotal		33	2,824	32	3,608						

Balsam Fir	1-20												
	21-40		202										
	41-60		1,216										
	61-80		625										
	81-100		340										
	101-120												
	121-140												
	141-160												
	161-180												
	181-200												
	200+												
Forest Unit Subtotal		22	2,383										
Other Conifer	1-20												
	21-40		11										
	41-60		61		36								
	61-80												
	81-100		179										
	101-120		221		51								
	121-140		238		76								
	141-160				31								
	161-180				39								
	181-200												
	200+												
Forest Unit Subtotal		334	710		233								

Larch	1-20				186						
	21-40				43						
	41-60				55						
	61-80				10						
	81-100				12						
	101-120				66						
	121-140				18						
	141-160				10						
	161-180				11						
	181-200										
	200+										
Forest Unit Subtotal				212	411						
All Forest Unit Total		21,434	250,003	20,532	286,902						
2000-2005 FMP Forest Units											
PoPur	1-20					10	1,373				
	21-40						283				
	41-60						218				
	61-80						1,950				
	81-100						3,151				
	101-120						907				
	121-140					5	506				
	141-160										
	161-180						3				
	181-200										
	200+										
Forest Unit Subtotal						15	8,391				

Ocon	1-20						522				
	21-40						1,923				
	41-60						1,816				
	61-80						109				
	81-100						37				
	101-120					36	198				
	121-140					93	185				
	141-160					47	202				
	161-180					198	76				
	181-200										
	200+						11				
Forest Unit Subtotal						374	5,079				
PoMix	1-20						730				
	21-40					5	1,318				
	41-60					8	2,315				
	61-80						1,480				
	81-100						1,914				
	101-120						1,037				
	121-140						835				
	141-160						21				
	161-180										
	181-200										
	200+										
Forest Unit Subtotal						13	9,650				

MxWd	1-20						1,047				
	21-40						4,220				
	41-60						3,239				
	61-80					16	3,694				
	81-100						3,210				
	101-120						2,027				
	121-140						2,664				
	141-160						293				
	161-180						123				
	181-200						36				
	200+						8				
Forest Unit Subtotal						16	20,561				
SbClg	1-20					92	22,958				
	21-40						12,463				
	41-60					154	12,590				
	61-80					193	6,724				
	81-100					320	10,921				
	101-120					1336	9,254				
	121-140					6809	36,245				
	141-160					8169	23,648				
	161-180					2100	2,784				
	181-200					40	199				
	200+						5				
Forest Unit Subtotal						19,213	137,791				

SbHs	1-20						1,116				
	21-40						3,169				
	41-60					8	1,868				
	61-80						785				
	81-100					13	3,226				
	101-120					36	1,863				
	121-140					32	5,291				
	141-160					159	1,151				
	161-180					133	267				
	181-200										
	200+						19				
Forest Unit Subtotal						381	18,755				
MixCo	1-20						1,914				
	21-40						6,723				
	41-60						2,372				
	61-80					16	1,273				
	81-100					19	1,061				
	101-120						918				
	121-140						1,389				
	141-160						900				
	161-180						49				
	181-200						40				
	200+										
Forest Unit Subtotal						35	16,639				

SpInt	1-20					556	18,955				
	21-40					260	4,547				
	41-60					40	1,894				
	61-80					211	2,637				
	81-100					563	10,286				
	101-120					421	6,599				
	121-140					1272	12,824				
	141-160					2019	13,970				
	161-180					21	952				
	181-200					7	71				
	200+						48				
Forest Unit Subtotal						5,370	72,783				
BwPmx	1-20						148				
	21-40						414				
	41-60						525				
	61-80						688				
	81-100						144				
	101-120					32	29				
	121-140						77				
	141-160										
	161-180										
	181-200										
	200+										
Forest Unit Subtotal						32	2,025				

SpUpl	1-20						1,547				
	21-40						405				
	41-60						737				
	61-80						1,399				
	81-100						1,822				
	101-120						2,099				
	121-140						3,371				
	141-160						471				
	161-180					29	11				
	181-200										
	200+										
Forest Unit Subtotal						29	11,862				
All Forest Unit Total		-	-	-	-	25,478	303,536				
2005-2010 FMP Forest Units											
BOG	B&S							-	-	-	-
	1-20							167	-	-	-
	21-40							87	-	-	-
	41-60							103	-	-	-
	61-80							349	-	-	-
	81-100							302	-	-	-
	101-120							677	-	-	-
	121-140							2,791	-	-	-
	141-160							10,143	-	-	-
	161-180							3,299	-	-	-
	181-200							76	-	-	-
	200+								-	-	-
Forest Unit Subtotal								17,995	-	-	-

HWD	B&S							330	-	-	-
	1-20							1,756	3,341	1,493	1,543
	21-40							2,089	1,597	3,827	2,039
	41-60							1,220	776	1,362	1,912
	61-80							2,117	1,777	404	1,271
	81-100							3,011	2,869	159	1,545
	101-120							1,814	1,834	349	348
	121-140							767	390	379	-
	141-160							159	443	89	-
	161-180							5	-	34	-
	181-200								5	-	-
	200+								-	-	15
Forest Unit Subtotal								13,268	13,031	8,096	8,673
LC1	B&S							14	-	-	-
	1-20							1,386	2,306	5,287	2,769
	21-40							5,792	3,531	2,298	6,481
	41-60							9,354	8,842	3,514	7,442
	61-80							1,171	3,984	8,798	4,133
	81-100							633	829	3,964	5,183
	101-120							925	558	825	1,789
	121-140							887	935	642	22
	141-160							2,100	1,092	388	-
	161-180							1,122	345	238	-
	181-200								848	544	-
	200+								-	807	142
Forest Unit Subtotal								23,384	23,269	27,304	27,962

MWD	B&S							-	-	-	-
	1-20							2,865	4,730	6,329	5,810
	21-40							4,923	3,300	5,782	5,440
	41-60							4,340	4,541	5,484	5,440
	61-80							4,096	4,391	4,238	5,019
	81-100							3,086	3,051	941	2,878
	101-120							1,905	1,022	891	983
	121-140							2,609	1,429	195	-
	141-160							902	1,988	109	-
	161-180							62	6	140	-
	181-200								56	-	-
	200+								-	55	-
Forest Unit Subtotal								24,788	24,514	24,165	25,571
PJ1	B&S							36	-	-	-
	1-20							133	277	106	190
	21-40							25	67	274	141
	41-60							46	19	66	99
	61-80							209	107	19	58
	81-100							65	70	54	13
	101-120							26	-	-	-
	121-140							72	-	-	-
	141-160							35	94	-	-
	161-180								-	35	-
	181-200								-	-	-
	200+								-	-	33

Forest Unit Subtotal								647	633	554	534
SF1	B&S							-	-	-	-
	1-20							5,470	5,317	3,297	6,677
	21-40							6,162	4,448	5,650	3,997
	41-60							8,954	9,073	7,334	7,777
	61-80							2,353	3,686	9,843	5,841
	81-100							2,565	2,796	4,204	3,140
	101-120							2,475	2,736	2,649	-
	121-140							3,257	1,185	730	-
	141-160							1,977	3,205	105	-
	161-180							92	385	13	-
	181-200							31	86	1	0
	200+							11	31	20	-
Forest Unit Subtotal								33,347	32,949	33,846	27,431
SP1	B&S							441	-	-	-
	1-20							2,034	3,831	2,892	3,416
	21-40							4,471	4,312	4,046	5,491
	41-60							1,651	2,005	5,633	3,703
	61-80							2,040	2,014	2,883	3,002
	81-100							1,894	1,753	2,489	2,332
	101-120							1,654	1,818	492	-
	121-140							1,362	884	397	-
	141-160							1,979	94	290	-
	161-180							76	34	60	-
	181-200							16	-	4	-
	200+								15	-	-

Forest Unit Subtotal								17,618	16,760	19,185	17,946
SB1	B&S							3,991	-	-	-
	1-20							18,949	21,801	10,012	17,184
	21-40							10,170	14,515	21,627	18,370
	41-60							3,073	4,100	14,399	15,064
	61-80							3,300	3,325	4,067	13,455
	81-100							6,661	4,386	3,298	9,697
	101-120							10,456	11,691	4,351	1,728
	121-140							8,785	5,805	8,850	-
	141-160							20,979	6,228	1,562	-
	161-180							2,702	15,413	2,484	-
	181-200							86	916	14,366	6
	200+								38	321	61
Forest Unit Subtotal								89,152	88,218	85,337	75,565
SB3	B&S							2,637	-	-	-
	1-20							23,212	35,531	26,549	21,337
	21-40							15,304	18,630	36,010	19,867
	41-60							12,763	10,312	18,537	15,854
	61-80							6,227	11,529	10,261	14,088
	81-100							7,310	4,003	11,472	26,185
	101-120							10,497	11,341	3,983	25,601
	121-140							16,553	8,869	11,124	-
	141-160							38,610	27,222	1,742	-
	161-180							7,443	7,196	5,436	-
	181-200							281	2,235	5,120	11
	200+							27	154	780	30
Forest Unit Subtotal								140,864	137,022	131,014	122,972
All Forest Unit Subtotal								361,063	336,396	329,502	306,653

All Fus	B&S							7,449	-	-	-
	1-20		74		18,860	658	50,310	55,972	77,135	55,964	58,926
	21-40		7,539		30,334	265	35,465	49,023	50,399	79,514	61,826
	41-60		22,650		29,824	210	27,574	41,504	39,667	56,329	57,290
	61-80		36,073		17,812	436	20,739	21,862	30,813	40,513	46,867
	81-100		29,325		39,104	915	35,772	25,527	19,757	26,582	50,974
	101-120		63,703		26,095	1,861	24,931	30,429	30,999	13,541	30,450
	121-140		90,639		73,685	8,211	63,387	37,083	19,497	22,317	22
	141-160		0		46,313	10,394	40,656	76,884	40,366	4,285	-
	161-180		0		4,528	2,481	4,265	14,801	23,380	8,439	-
	181-200		0		336	47	346	490	4,146	20,035	17
	200+		0		11	-	91	38	237	1,983	280
All Forest Unit Total		21,434	250,003	20,532	286,902	25,478	303,536	361,063	336,396	329,502	306,653
Total Productive Forest		271,437		307,434		329,014		361,063	336,396	329,502	306,653

Sources: 1990-95 available based on Table 4.9, while remaining areas based on Table 4.8.2.

1995-00 available based on Table 4.13.1 and Table 4.8.2.

2000-2005 based on FMP-9

2005-2010 Plan Start based on FMP-9 (2005 2010 FMP)

MANAGEMENT UNIT NAME: Smooth Rock Falls
PLAN PERIOD: 2005 To 2010
ANNUAL REPORT: 2009 To 2010

AR-12: Summary of Habitat for Species at Risk and Selected Wildlife Species

	Area of Habitat (ha)							
	Past Plans			**Current Plan 2005-2010				
					Projections			
Wildlife Species	1990-1995	1995-2000	*2000-2005	Plan Start 2005	Short-Term 2015	Medium- Term 2025	Long-Term 2105	Plan End 2010
Bay-breasted Warbler	n/a	n/a	46,324.00	46,332.07	43,024.55	43,866.01	39,241.68	46,604.20
Black-backed Woodpecker	n/a	n/a	34,851.00	34,864.29	36,219.53	34,991.89	26,736.76	33,308.97
Black Bear (Summer)	n/a	n/a	59.00	59.49	44.90	29.25	32.89	88.86
Black Bear (Autumn)	n/a	n/a	26,188.00	26,192.06	20,190.83	20,446.86	20,337.49	26,502.55
Boreal Chickadee	n/a	n/a	41,879.00	41,888.48	43,203.56	44,056.36	40,411.09	43,478.65
Blue-spotted Salamander*	n/a	n/a	324,947.00	324,980.00	330,144.59	329,805.28	325,817.38	327,709.78
Lynx	n/a	n/a	28,931.00	28,939.67	22,329.63	20,415.00	24,634.52	28,078.77
Woodland Caribou	n/a	n/a	242.00	242.42	104.03	96.61	88.36	174.92
Deer Mouse	n/a	n/a	7,137.00	7,137.30	8,574.84	8,131.94	12,542.94	9,480.62
Great Grey Owl	n/a	n/a	5,726.00	5,726.41	4,496.81	5,069.43	4,470.89	5,579.57
Least Flycatcher	n/a	n/a	42,959.00	42,968.39	42,810.94	41,165.07	37,803.53	45,186.59
Marten	n/a	n/a	60,867.00	60,884.92	57,039.27	57,039.19	47,766.71	59,478.08
Moose (St)	n/a	n/a	7,050.00	7,050.05	8,507.31	8,059.56	12,456.99	9,370.82
Moose (LW)	n/a	n/a	77,193.00	77,200.94	78,745.03	79,018.60	73,554.78	74,648.78
Northern Flying Squirrel	n/a	n/a	58,809.00	58,827.06	55,061.50	54,694.83	43,619.64	57,889.70
Pileated Woodpecker	n/a	n/a	2,137.00	2,136.74	1,506.21	1,485.11	630.60	2,873.66
Ruby-crowned Kinglet	n/a	n/a	156,857.00	156,875.09	134,843.11	129,891.58	164,141.33	139,567.62

Wildlife Species	1990-1995	1995-2000	*2000-2005	Plan Start 2005	Projections			Plan End 2010
					Short-Term 2015	Medium- Term 2025	Long-Term 2105	
Ruffed Grouse	n/a	n/a	1,950.00	1,949.98	1,745.72	1,727.48	1,731.05	1,996.02
Snowshoe Hare	n/a	n/a	28,931.00	28,939.67	22,329.63	20,415.00	24,634.52	28,078.77
Spruce Grouse	n/a	n/a	171.00	171.46	166.44	207.16	216.66	144.60
Sharp Shinned Hawk	n/a	n/a		98,958.95	99,343.17	105,685.02	158,576.83	90,079.03
White-throated Sparrow	n/a	n/a	21,266.00	21,266.01	21,570.90	17,193.07	26,359.58	23,456.28

Source: 2000-2005 RPFO-16
2005-2010 FMP-5 and SFMM Files

MANAGEMENT UNIT NAME: Smooth Rock Falls

PLAN PERIOD: 2005 To 2010

ANNUAL REPORT: 2005 To 2009 (4 years)

AR-13: Summary of Assessment of Regeneration and Silvicultural Success

		Area Assessed				
		Area Successfully Regenerated			Area Not Successfully Regenerated	Total Area Assessed
Forest Unit	Silvicultural Ground Rule	Projected Forest Unit	Other Forest Unit	Total		
Harvest						
HWD	HWD-111-HWD-E1	169.1	110.6	279.7		279.7
	HWD-113-SB1-B1	0.3		0.3		0.3
	Forest Unit Subtotal	169.4	110.6	280.0	0.0	280.0
LC1	LC1-111-LC1-E1	74.9	59.6	134.5	73.2	207.6
	LC1-111-MWD-E1	20.4	32.3	52.7	32.2	84.9
	LC1-113-LC1-B1	64.6	7.9	72.5		72.5
	LC1-123-SB1-I1	18.8		18.8		18.8
	LC1-221-SB1-I2		1.0	1.0		1.0
	Forest Unit Subtotal	178.7	100.8	279.5	105.4	384.9
MWD	MWD-111-HWD-E1	118.1	64.4	182.4	31.2	213.7
	MWD-111-MWD-E1	184.5	135.0	319.4	2.2	321.7

	MWD-221-SB1-I2	13.2	41.0	54.2		54.2
	Forest Unit Subtotal	315.8	240.3	556.1	33.5	589.6
PJ1	PJ1-111-SP1-E1	1.5	11.7	13.1		13.1
	Forest Unit Subtotal	1.5	11.7	13.1	0.0	13.1

		Area Successfully Regenerated				
Forest Unit	Silvicultural Ground Rule	Projected Forest Unit	Other Forest Unit	Total	Area Not Successfully Regenerated	Total Area Assessed
SB1	SB1-111-SB1-E1	328.8	855.0	1183.8	304.8	1488.6
	SB1-113-SB1-B1	339.8	11.6	351.4		351.4
	SB1-121-SB1-I1	9.5	2.5	12.0		12.0
	SB1-123-SB1-I1	1.2	17.4	18.6		18.6
	SB1-131-SB1-B1	30.6		30.6	15.2	45.8
	SB1-133-SB1-B1	98.6		98.6		98.6
	SB1-223-SB1-I2	297.4	3.5	300.9		300.9
	Forest Unit Subtotal	1105.8	890.0	1995.8	320.0	2315.8
SB3	SB3-111-SB3-E1	666.6	452.5	1119.1	89.1	1208.2
	SB3-113-SB3-B1	450.7	150.6	601.3	12.0	613.3
	SB3-123-SB3-I1	11.3	2.8	14.1		14.1
	SB3-131-SB3-B1	3.1		3.1	16.7	19.8
	SB3-133-SB3-B1	45.2		45.2		45.2
	SB3-221-SB3-I2		11.2	11.2		11.2
	SB3-223-SB3-I2		1.4	1.4		1.4
	SB3-233-SB3-I2	91.5		91.5		91.5
	Forest Unit Subtotal	1268.4	618.5	1886.9	117.8	2004.7
SF1	SF1-111-MWD-E1	262.4	224.5	486.9	23.5	510.4
	SF1-113-SB1-B1	9.4		9.4		9.4

	SF1-123-SF1-I1	80.5		80.5		80.5
	Forest Unit Subtotal	352.3	224.5	576.8	23.5	600.3

		Area Successfully Regenerated				
Forest Unit	Silvicultural Ground Rule	Projected Forest Unit	Other Forest Unit	Total	Area Not Successfully Regenerated	Total Area Assessed
SP1	SP1-111-MWD-E1	8.4		8.4	46.8	55.2
	SP1-111-SP1-E1	7.6	3.0	10.6		10.6
	SP1-113-SP1-B1	20.9	49.2	70.1		70.1
	SP1-121-SP1-I1		9.0	9.0		9.0
	SP1-123-SB1-I1	9.6		9.6		9.6
	SP1-123-SF1-I1	31.6		31.6		31.6
	Forest Unit Subtotal	78.1	61.2	139.3	46.8	186.1
	Harvest Subtotal	3469.9	2257.5	5727.5	647.0	6374.4
Natural Disturbance						
HWD	HWD-111-MWD-P1	30.7		30.7		30.7
	Forest Unit Subtotal	30.7	0.0	30.7	0.0	30.7
LC1	LC1-111-LC1-P1	7.8		7.8		7.8
	Forest Unit Subtotal	7.8	0.0	7.8	0.0	7.8
SB1	SB1-111-SB1-P1	11.3	40.5	51.9		51.9
	Forest Unit Subtotal	11.3	40.5	51.9	0.0	51.9
SB3	SB3-111-SB3-P1	27.6	4.9	32.5		32.5
	Forest Unit Subtotal	27.6	4.9	32.5	0.0	32.5
SP1	SP1-111-SP1-P1	7.0		7.0		7.0

	Forest Unit Subtotal	7.0	0.0	7.0	0.0	7.0
	Disturbance Subtotal	84.4	45.5	129.9	0.0	129.9
Total		3554.3	2303.0	5857.3	647.0	6504.3

MANAGEMENT UNIT NAME: Smooth Rock Falls

PLAN PERIOD: 2005 To 2010

ANNUAL REPORT: 2009 To 2010

AR-14: Assessment of Objective Achievement

						Strategic Projections		
Management Objective/Indicator	Plan Start Level	Desirable Level	Timing of Assessment	Target		Medium (2025)	Long (2105)	Assessment
Quantifiable			During FMP Development					All management alternatives had 10 acceptable terms. All management alternatives were within plus or minus 50% of the natural run for all terms and met the objective.pg 169
I. Forest Diversity Objective Group								
A. Forest Unit Area (available and reserved)				>=	<=			
All FUs	374046	na		190,056	570,168	380112	379006	
BOG	18578	na		9,290	27,869	18579	18581	
LC1	23952	na		13,225	39,674	26449	31628	
MWD	26619	na		13,295	39,884	26589	32286	
PJ1	649	na		310	930	620	567	
HWD	14410	na		5,305	15,914	10609	9595	
SB1	89010	na		46,100	138,300	92200	88835	
SF1	36097	na		18,965	56,894	37929	33977	
SP1	18114	na		10,279	30,836	20557	19321	
SB3	146617	na		73,290	219,870	146580	144216	
B. Age Class Structure - Mature %			During FMP Development					All management alternatives had 10 acceptable terms. All management alternatives had greater than 15% in mature age classes and met the objective. Pg 172
Black Spruce Lowland (SBL)	55%	na		>=15%		39%	43%	
Mixedwoods (MW)	43%	na		>=15%		27%	34%	
Upland Conifer (PJSB)	41%	na		>=15%		33%	32%	
Hardwood (HWD)	59%	na		>=15%		31%	42%	

Management Objective/Indicator	Plan Start Level	Desirable Level	Timing of Assessment	Target	Medium (2025)	Long (2105)	Assessment
Black Spruce Lowland (SBL)	40%	na		>=5%	29%	13%	All management alternatives had 10 acceptable terms. All management alternatives had greater than 5% in over-mature age classes and met the objective. Pg 173
Mixedwoods (MW)	22%	na		>=5%	12%	10%	
Upland Conifer (PJSB)	22%	na		>=5%	12%	8%	
Hardwood (HWD)	31%	na		>=5%	20%	19%	
2. Social and Economic Group			During FMP Development				
A. SPF Wood Supply	220000.0	na		>=311,000	162998.0	234998	None of the mgmt alts were effective in achieving the objective target for all 10 terms. Pg 174
	na	na		+ or - 10% between term	-11%	2%	All alts did well. The selected mgmt alt was the best with 10 terms. Pg 175
B. Poplar Wood Supply	26846.5	na		>=7600	18576.7	19808.179	All mgmt atlts were effective in achieving the objective target for all 10 terms. Pg 175
	na	na		+ or - 10% between term	-15%	-9%	All alts were unsuccessful in achieving the target in all 10 terms. The mandatory alts 1 and 2 were successful in 4 of 10 terms. The selected and mandatory 3 alts achieved success in 10 and 9 terms, respectively. Pg 175
C. Poplar Veneer Wood Supply	1471.0	na		>=400	1852.3	82.063991	The selected could meet this objective in 8 of the 10 terms. Pg 176
	na	na		+ or - 10% between term	-15%	-9%	N/A
D. White Birch Wood Supply	2301.9	na		>=3,300	1602.5	1916.4203	All mgmt alts were ineffective in achieving any of the 10 terms. Pg 176
	na	na		+ or - 10% between term	-11%	2%	All mgmt alts were somewhat effective in achieving the objective target but not for all 10 terms. Pg 176
E. White Birch Veneer Wood Supply	80.9	na		>=400	119.0	5.3844762	None of the mgmt alts were effective in achieving the objective target for all 10 terms. Pg 177
	na	na		+ or - 10% between term	-15%	-14%	N/A

Management Objective/Indicator	Plan Start Level	Desirable Level	Timing of Assessment	Target		Medium (2025)	Long (2105)	Assessment
3. Forest Cover Objective Group			During FMP Development					Selected management alternative had 10 acceptable terms and was considered sustainable. Pg 16-169
A. Habitat for Selected Wildlife Species				deviation from natural				
Bay Breasted Warbler	46324	na		minimum	32,245	41166	41360	
Black Bear Foraging	59	na		minimum	24	48	75	
Black Bear Winter	26188	na		minimum	16,570	19177	22916	
Blackback Woodpecker	34851	na		minimum	27,881	36120	27881	
Blue Spotted Salamdr	324947	na		minimum	258,348	328115	322935	
Boreal Chickadee	41879	na		minimum	33,326	39203	39168	
Woodland Caribou	242	na		minimum	84	104	104	
Deer Mouse	7137	na		minimum	5,710	10462	11380	
Great Grey Owl	5726	na		minimum	2,982	3980	4637	
Least Flycatcher	42959	na		minimum	31,427	38406	35441	
Lynx	28931	na		minimum	19,861	22876	23504	
Marten	60867	na		minimum	45,267	55976	51917	
Moose	7050	na		minimum	5,640	10379	11261	
Moose Winter	77193	na		minimum	61,754	77339	75513	
Northern Flying Squirrel	58809	na		minimum	42,177	53499	45605	
Pileated Woodpecker	2137	na		minimum	639	1080	918	
Ruby Crowned Kinglet	156857	na		minimum	123,540	141290	157326	
Ruffed Grouse	1950	na		minimum	1,218	1718	1629	
Sharp Shinned Hawk	98959	na		minimum	69,601	106327	153608	
Snowshoe Hare	28931	na		minimum	19,861	22876	23504	
Spruce Grouse	171	na		minimum	95	166	151	
White Throated Sparrow	21266	na		minimum	14,814	22533	25512	

Management Objective/Indicator	Plan Start Level	Desirable Level	Timing of Assessment	Target		Medium (2025)	Long (2105)	Assessment
4. Silviculture Objective Group			During FMP Development					
A. 'Renewal Revenues and Expenditures	-81.111	na		rev. minus expend. >= 0		-92.47	131.774	The selected alternative met this objective, when long-term expenditures were compared to long-term revenues. Pg 177
B. Available Productive Forest Area	335601	na		>=335,637		332695	306647	None of the management alternatives were effective in achieving the objective target for all 10 terms, due to landbase reductions for reserves, roads and landings. Pg 177
C. Total Forest Area	374046	na		>=374,082		380112	379006	The desired Future Forest Condition for the selected management alternative has been met. Pg 177
Indicators of Sustainability 1. Forest Diversity Indicators of Sustainability			During FMP Development					All index values within bounds of natural variation. All management alternatives were considered sustainable. Pg 153-155
A. Forest Diversity Indices				>=	<=			
Forest Unit Diversity Indices								
Shannon-Weiner Heterogeniety Index	1.731	na		1.376	2.082	1.728	1.743	
Simpson's Heterogeneity Index	0.765	na		0.611	0.928	0.767	0.772	
Shannon Evenness Index	0.788	na		0.626	0.947	0.787	0.793	
Age Class Diversity Indices								
Shannon-Weiner Heterogeniety Index	2.774	na		2.220	3.631	2.843	2.833	
Simpson's Heterogeneity Index	0.931	na		0.745	1.139	0.934	0.934	
Shannon Evenness Index	0.911	na		0.728	1.115	0.907	0.869	
Wildlife Habitat Diversity Indices								
Shannon-Weiner Heterogeniety Index	1.543	na		1.207	1.852	1.516	1.535	
Simpson's Heterogeneity Index	0.664	na		0.529	0.812	0.664	0.673	
Shannon Evenness Index	0.585	na		0.458	0.702	0.575	0.582	

Management Objective/Indicator	Plan Start Level	Desirable Level	Timing of Assessment	Target		Medium (2025)	Long (2105)	Assessment
2. Multiple Benefits to Society Indicators of Sustainability A. Managed Crown Forest Available for Timber Production			During FMP Development	>=	<=			There was no available forest area in the Bog forest unit as the forest unit is reserved. All management alternatives had 10 acceptable terms except SF1. All management alternatives were within the natural bounds and were considered sustainable. Pg 156
All FUs	335601	na		268,510	411,700	332695	306647	
BOG	0	na		0	0	0	0	
LC1	23370	na		18,696	38,188	25623	27963	
MWD	24788	na		17,602	38,489	23190	24976	
PJ1	611	na		308	733	567	533	
HWD	12938	na		5,617	15,526	8615	8402	
SB1	85161	na		68,129	106,784	86985	75569	
SF1	33329	na		26,663	45,053	35034	28166	
SP1	17177	na		11,691	24,348	19409	18075	
SB3	138227	na		107,846	166,982	133272	122963	
B. Available Harvest Area Available to be Utilized			During FMP Development					All management alternatives meet the objective since all of the forest unit AHA is available to be harvested. Pg 158-160
All FUs	100	na		>=99%		100	100	
BOG	100	na		>=99%		100	100	
LC1	100	na		>=99%		100	100	
MWD	100	na		>=99%		100	100	
PJ1	100	na		>=99%		100	100	
HWD	100	na		>=99%		100	100	
SB1	100	na		>=99%		100	100	
SF1	100	na		>=99%		100	100	
SP1	100	na		>=99%		100	100	
SB3	100	na		>=99%		100	100	
Non-Quantifiable								

To provide marten core areas on the Smooth Rock Falls Forest (1.4)	Marten Core areas have been defined spatially and deferred from the productive land base modeled in SFMM for 60 years. These areas were established by MNR and Company staff and meet the guideline requirements. This objective is fully achieved in this management alternative.
Ensure the genetic diversity of trees is conserved (Objective 1.7)	Maintaining a seed bank for black and white spruce and jack pine with seeds collected from the appropriate seedzone. Continued use of natural regeneration via silviculture treatments such as careful logging, and HARP will maintain local genetics and diversity adapted to those sites.
Provide for the long-term health and vigour of Crown forests by using forest practices that, within the limits of silvicultural requirements emulate natural disturbance patterns and landscape patterns (2.1)	Harvest patches must be separated from each other by forest patches of at least one structural age class difference of +/- 20 years. This target is achieved through the selection of harvest areas by leaving unharvested patches that will generally be of sufficiently young age to facilitate a return harvest following the 20 year plan horizon.
Minimize the adverse affects on water quality and aquatic habitat within areas of harvest operations, renewal activities, tending and access operations (3.1)	Forest management activities will be conducted in a manner that minimizes and mitigates the impacts on the physical environment, water quality and aquatic habitat within areas of forest operations. Specific strategies are achieved through the application of appropriate guidelines
Ensure that the available forest is protected from sustained deforestation or conversion to other uses (4.1)	Annual surveys will be conducted to assess the regeneration needs of harvested sites. From these assessments the appropraite silvicultural package will be developed to ensure successful regeneration of the site.
Socioeconomic Evaluation (6, 7)	Based on the yearly volume generated by this alternative, a reasonably stable level of economic activity is sustained. This economic activity provides benefits to local, regional, and provincial economics.

Source: FMP-12 from the 2005-2010
Smooth Rock Falls FMP